GOVERNMENT POLYTECHNIC, KOLHAPUR – 416004.

(An Autonomous Institute of Govt. Of Maharashtra)

EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **FIFTH** PROGRAM : **INFORMATION TECHNOLOGY**

COURSE CODE :- **ITE507/IF402**

COURSE NAME :- **MOBILE COMMUNICATION**

MAX. MARKS : **80** TIME : **3 HRS.** DATE :- **02 / 05 / 2017**

Instruction :-

1) Answer to two sections must be written in separate section answer book provided.
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available o request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Section – I

Marks

Q.1 Attempt any **FOUR** (08)

a) Define user mobility.

b) List any four wireless data technologies.

c) Draw neat diagram of simple antenna.

d) What is mean by frequency hopping?

e) Define pure FDMA.

f) List supplementary services of GSM.

Q.2 Attempt any **FOUR** (16)

a) Explain any four applications of wireless networks and mobile communication.

b) Write note on multipath propagation.

c) What is need of modulation? Explain with reasons.

d) Explain hidden and exposed terminals.

e) Write note on carrier sense multiple access.

f) Describe Tele services of GSM.

Q.3 Attempt any **FOUR** (16)

a) Write note on path loss of radio signals.

b) Draw and explain sectorized antenna.

c) Describe TDMA and SDMA.

d) Write note on Global system for Mobile communication (GSM).

e) Explain bearer services of GSM.

f) Explain architecture of GSM with neat diagram.

P.T.O.

Section – II	Marks

Q.4 Attempt any **FOUR** (08)

a) What is scatter net?

b) Draw the figure for client initialization via DHCP.

c) List advantages of MTCP.

d) Draw the states of client in coda.

e) What are the requirements of mobile IP?

f) Define fast retransmission.

Q.5 Attempt any **FOUR** (16)

a) State and explain entities and terms in mobile IP.

b) Explain Bluetooth with its Architecture.

c) Explain indirect TCP with its advantages and disadvantages.

d) Write a note on infrastructure based Wireless LAN.

e) Explain Wireless Adhoc network.

f) Explain advantages and disadvantages of snooping TCP.

Q.6 Attempt any **FOUR** (16)

a) Compare infrared and radio transmission.

b) Explain working of DHCP.

c) Explain IEE 802.11 system Architecture.

d) Explain in detail fast retransmission / Fast recovery.

e) Explain WAP with respect to its features and applications.

f) Write a note on security issues in mobile computing.

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EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **THIRD** PROGRAM : **INFORMATION TECHNOLOGY**

COURSE CODE :- **ITE302/IF202/IT202**

COURSE NAME :- **DIGITAL ELECTRONICS**

MAX. MARKS : **80** TIME : **3 HRS.** DATE: - **04 / 05 / 2017**

Instruction:-

1) Answers must be written in the main answer book provided.(and supplements if required)
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Marks

Q.1 Attempt any **FOUR** (08)

a) Convert $(256)_{10} = (\ ?\ )_2$.

b) State De'Morgan's 1st theorem and prove.

c) Differentiate Multiplexer and Demultiplexer. (2 points)

d) Subtract using 1's complement. $(10111101)_2 - (01000010)_2$.

e) Prove $AB+ABC+A\overline{B} = A$.

f) Draw 8:1 Multiplexer.

Q.2 Attempt any **FOUR** (16)

a) Subtract using 9's complement (789) – (123).

b) Write any four laws of Boolean Algebra.

c) Explain with block diagram, 1:4 demultiplexer.

d) Subtract using 10's complement (813- 214).

e) State i) Associative law ii) distributive law.

f) Draw and explain full subtractor.

Q.3 Attempt any **FOUR** (16)

a) Convert $(1134.16)_{10} = (\ )_{16}$.

b) Solve i) $A + \overline{A}B + AB$ ii) $(AB + C) . (AB + D)$

c) Draw and explain full adder using half adder.

d) Find $(FC14)_{16} = (\ )_{10}$.

e) Explain 4 bits binary adder using 7483.

f) Explain working of parallel binary adder.

P.T.O.

Q.4 Attempt any **FOUR** (08)

a) Compare combinational and sequential circuit. (two points)

b) Draw one bit memory cell using NOR gate.

c) State two applications of ADC.

d) List any four ADC specifications.

e) Classify memories on the basis of principle of operation.

f) Compare RAM and ROM (two points)

Q.5 Attempt any **FOUR** (16)

a) Draw circuit diagram of SR flipflop using NAND gate. Describe its working.

b) Explain working of ring counter with neat diagram and timing waveform.

c) Draw and explain working of 4 bit PISO shift register.

d) What do you understand by EPROM, EEPROM, ROM and PROM?

e) Draw block diagram of ADC 0809.

f) Draw four bits weighted resistor DAC and give expression for output voltage.

Q.6 Attempt any **TWO** (16)

a) Describe working of dynamic MOS RAM cell with neat diagram.

b) Describe working of dual slope ADC with neat block diagram and waveforms.

c) For MOD-11 ripple up counter
   i) Draw circuit diagram. Use T flip flop.
   ii) Write truth table.
   iii) Draw timing diagram.
   iv) What are disadvantages of ripple counter?

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EVEN TERM END EXAM APRIL/MAY-2017

EXAM SEAT NO. | | | | | | |

LEVEL: SECOND. PROGRAM: **INFORMATION TECHNOLOGY**

COURSE CODE: IF211 COURSE NAME: **MICROPROCESSOR**

MAX. MARKS: 80 TIME: 3 HRS. DATE: **19/04/2017.**

Instruction:-

1) Answers must be written in the main answer book provided. (and supplements if required)
2) Figure to the right indicates marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Marks

Q.1 Attempt any **FOUR** **(08)**

a) Explain any two examples of logical instructions.

b) Compare 8085 microprocessor with 8086 microprocessor (any two points)

c) Enlist the types of microprocessor from its evolution.

d) State the limitations of 8 bit microprocessor.

e) Write a short note on memory segmentation.

f) State the functions of Bus Interface Unit (BIU) in 8086 microprocessor.

Q.2 Attempt any **FOUR** **(16)**

a) With help of example, explain any four arithmetic instructions from 8086 µp.

b) Draw a neat labeled block diagram of 8086 architecture and explain each block.

c) Explain MOV instructions with any four examples.

d) Explain the concept pipelining used in 8086 µp in detail.

e) Explain program control transfer & process control with examples.

f) With help of diagram explain generation of 20 bit Physical Address in 8086 µp.

Q.3 Attempt any **TWO.** **(16)**

a) Explain register organisation in detail with neat diagram.

b) With labeled blocks explain architecture of 8085 µp in detail.

c) Enlist different addressing modes and explain them with examples.

PTO

Q.4 Attempt any **FOUR** **(08)**

a) Define 1) Algorithm 2) Flowchart

b) Enlist program development steps

c) Describe PUSH instruction

d) Write advantages of using procedure in assembly language programming.

e) Write any two control signals of 8086 microprocessor; those are used for memory interfacing. Also state their functions.

f) How many maximum number of I/O devices can be connected in

1) I/O mapped I/O

2) Memory mapped I/O

Q.5 Attempt any **TWO** **(16)**

a) Describe following assembly language programming tools with reference to their definition and function 1)Editor 2)Assembler 3)Linker 4)Debugger

b) Describe how to define and use procedure in 8086 ALP with one example.

c) Write assembly language program to multiply two 8 bit numbers. Write comments.

Q.6 Attempt any **TWO.** **(16)**

a) Describe any four directives used in 8086 assembly language programming.

b) Describe CALL and RET instructions used for procedures.

c) Identify diagram shown in fig. Q.6.(C) and describe in brief with comparison between figures A and B

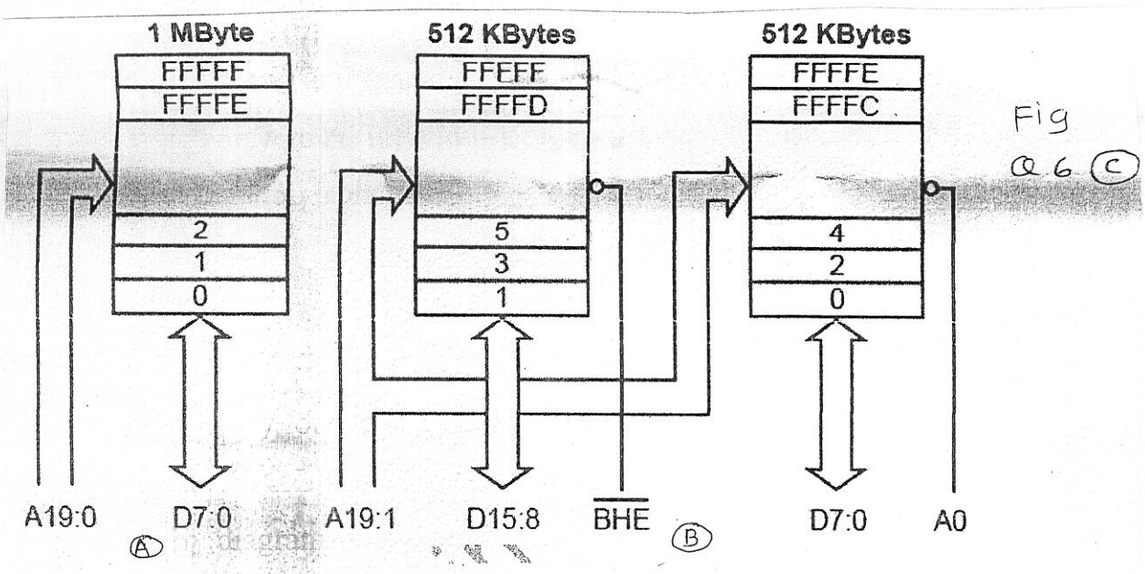

Fig Q.6 (C)

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EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **THIRD** PROGRAM : **INFORMATION TECHNOLOGY**
COURSE CODE :- **ITE306/IF207**
COURSE NAME :- **COMPUTER NETWORK**
MAX. MARKS : **80** TIME : **3 HRS.** DATE: - **19 / 04 / 2016**

Instruction:-
1) Answers must be written in the main answer book provided.(and supplements if required)
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Marks

Q.1 Attempt any **FOUR** (08)

a) Define protocol.

b) What is point to point connection?

c) Give advantages of Mesh topology.

d) Explain Hubs and its types.

e) Define coaxial standards.

f) Explain twisted pair cable.

Q.2 Attempt any **FOUR** (16)

a) Describe client server network.

b) Explain Ring topology in detail.

c) Draw and explain OSI reference model.

d) Define and differentiate between switch and router.

e) Define Radio wave.

f) Explain fiber optics with its modes.

Q.3 Attempt any **FOUR** (16)

a) Explain application of computer networks.

b) What is centralized and distributed computing?

c) Describe LAN in detail.

d) Explain ATM model.

e) Explain repeater, bridges and its types.

f) Define infrared waves.

PTO

Q.4 Attempt any **FOUR** (08)

a) What are the goals of Gigabit Ethernet?

b) What is the function of TELENET?

c) Define super netting.';

d) What is the function of RARP?

e) Write Asymmetric key cryptography?

f) Define S-box.

Q.5 Attempt any **FOUR** (16)

a) Explain Token Bus with diagram.

b) Compare 10 Base 5, 10 Base 2, 10 Base t & 10Base f.

c) Explain TCP/IP protocol suit.

d) What is the function of HTTP and WWW.

e) Explain Transposition cipher with example.

f) Explain X-OR & Rotation cipher.

Q.6 Attempt any **FOUR** (16)

a) Draw and explain Token Ring Format.

b) Draw and explain Data link layer of IEEE standard.

c) What are functions of TCP and UDP protocol?

d) What are the functions of DHCP and DNS?

e) Explain Deffi-Helman cryptosystem.

f) Explain substitution cipher.

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EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **FOURTH** PROGRAM : **INFORMATION TECHNOLOGY**

COURSE CODE :- **ITE402/IT302**

COURSE NAME :- **SOFTWARE ENGINEERING**

MAX. MARKS : **80** TIME : **3 HRS.** DATE :- **21 / 04 / 2017**

Instruction :-

1) Answer to two sections must be written in separate section answer book provided.
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available o request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Section – I Marks

Q.1 Attempt any **FOUR** (08)

a) What is software?

b) List any four life cycle models.

c) What is requirement engineering?

d) What is LOC?

e) List software applications.

f) What is planning?

Q.2 Attempt any **FOUR** (16)

a) What is software engineering approach? Explain.

b) What is waterfall model explain with diagram?

c) What is DFD? Explain level-o and level-1 DFD with diagram.

d) Explain Risk Management activities.

e) What is facilitated application specification technique?

f) Explain following i) Cost Estimation ii) Function count.

Q.3 Attempt any **FOUR** (16)

a) Explain the role of management in software development.

b) What are advantages and disadvantages of build and fix model?

c) Explain format of SRS with example.

d) Explain size estimation.

e) Explain any two life cycle models.

f) Explain crucial process steps in requirement engineering.

PTO

Section – II	Marks

Q.4 Attempt any **FOUR** (08)

a) List objectives of software design.

b) What is mean by Data coupling?

c) Sketch software design framework.

d) Define software testing.

e) List number of reasons for support unit testing.

f) Define perfective maintenance.

Q.5 Attempt any **FOUR** (16)

a) Describe conceptual and technical software designs.

b) Write a note on code efficiency and memory efficiency.

c) Why should we test software? Who should do the testing?

d) List and explain problems during maintenance.

e) Explain any two potential solutions to maintenance problems.

f) Describe Bottom-up design with diagram.

Q.6 Attempt any **TWO** (16)

a) Explain module cohesion with its type.

b) Describe integration testing with its approaches.

c) Write a note on maintenance process with diagram.

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EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **FOURTH** PROGRAM : **INFORMATION TECHNOLOGY**

COURSE CODE :- **ITE401/IT301**

COURSE NAME :- **NETWORK ADMINISTRATION**

MAX. MARKS : **80** TIME : **3 HRS.** DATE :- **19 / 04 / 2017**

Instruction :-

1) Answer to two sections must be written in separate section answer book provided.
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available o request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Section – I

Marks

Q.1 Attempt any **FOUR** (08)

a) List early phases of the internetwork design process.

b) What is the components of a home or small office network?

c) State use of modem.

d) What is mean by name space?

e) State use of global catalog server.

f) Define distinguished name (DN)

Q.2 Attempt any **FOUR** (16)

a) Describe network design overview.

b) Write note on public switched telephone network (PSTN)

c) List and explain DHCP objectives.

d) What is mean by Root server? Explain its types.

e) Describe genric domains with its diagram.

f) Explain object naming with its type.

Q.3 Attempt any **FOUR** (16)

a) Explain the following terms related to network design.

i) Choosing a network speed. ii) Expanding the network.

b) Describe DHCP message type options.

c) Explain DSL with its diagram.

d) How to install DNS server in windows server 2003?

e) Describe purpose of DNS with diagram.

f) Write note on DNS and Active directory.

PTO

Section – II	Marks

Q.4 Attempt any **FOUR** (08)

a) Enlist any four backup devices.

b) State any two advantages of driver updates.

c) Define differential backups.

d) Enlist four commands of operating system utilities.

e) State limitations of firewall (any two)

f) Enlist characteristics of good firewall.

Q.5 Attempt any **FOUR** (16)

a) Explain concept of backup hardware.

b) Describe target selection and filtering.

c) Explain net diagnostics and net config. with syntax. (commands).

d) Explain Traceroute with syntax and its parameters.

e) Explain contents of security association database.

f) Enlist the types of firewall. Explain packet filtering router.

Q.6 Attempt any **FOUR** (16)

a) Describe prevention from virus infection.

b) What is mean by software patches and software upgrades?

c) Explain Netstat with its syntax.

d) Explain functions of NET START & NET STOP commands with syntax.

e) Describe authentication header in transport and tunnel mode of IPSec.

f) Describe the working of single homed bastion and screened subnet firewall with suitable diagram.

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EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **FOURTH** PROGRAM : **INFORMATION TECHNOLOGY**

COURSE CODE :- **ITE404/IT305**

COURSE NAME :- **WEB TECHNOLOGY**

MAX. MARKS : **80** TIME : **3 HRS.** DATE :- **20/ 04 / 2017**

Instruction :-

1) Answer to two sections must be written in separate section answer book provided.
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available o request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Section – I

Marks

Q.1 Attempt any **FOUR** (08)

a) What are cookies?

b) Explain the term – ODBC.

c) State the differences between ADO and ADO.Net. (any four)

d) List properties and methods of error collection.

e) What is significance of timeout property of session object?

f) Enlist properties of listbox control.

Q.2 Attempt any **FOUR** (16)

a) Explain role of Internet Information Server.

b) Explain syntax of open method of connection object.

c) Write code to write cookies on client computer.

d) Describe steps to connect to database. Using DSNless connection.

e) Explain role of session object.

f) Write ASP code to demonstrate use of global.asa file.

Q.3 Attempt any **TWO** (16)

a) Describe features of ASP.Net IDE.

b) Explain syntax and use of following methods of server object

i) Execute ( ) ii) Transfer ( ) iii) Mappath ( ) iv) HTML Encode ( )

c) i) Explain advantages and disadvantages of cookies. (04)

ii) What does connectionstring refer to? (04)

PTO

	Section – II	Marks
Q.4	Attempt any **FOUR**	(08)

a) What is dataset?

b) Enlist type of security.

c) What is datatable?

d) What is Directive check in role based security?

e) What is XML?

f) What is SGML?

Q.5 Attempt any **FOUR** (16)

a) State the purpose of Data adapter control. Explain it using ASP.Net.

b) How to connect datagrid using programming technique to dataset?

c) Describe CDONTS object with syntax.

d) Explain form Based Authentication using a database.

e) Explain XML as Meta language.

f) What is principal and identify object?

Q.6 Attempt any **FOUR** (16)

a) Write a short note on web config.

b) Explain the term a) Atomicity b) Consistency.

c) Describe data list control.

d) What is mean by authentication and authorization?

e) What are the advantages and disadvantages of XML?

f) Explain CAS Based security.

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EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **SECOND** PROGRAM : **COMMON**

COURSE CODE :- **CCF/CCE202/X106**

COURSE NAME :- **COMMUNICATION SKILLS**

MAX. MARKS : **40** TIME : **2HRS.** DATE: - **20 / 04 / 2017**

Instruction:-

1) Answers must be written in the main answer book provided.(and supplements if required)
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Marks

Q.1 Attempt any **FOUR (Answer the following questions in 3-5 sentences).** (08)

a) Write importance of oral communication for engineers.

b) Write four examples of oral communication.

c) State the advantages of written communication.

d) Define the term artefacts.

e) Write two advantages of LCD projector.

f) Explain panel interview.

Q.2 Attempt any **FOUR** (16)

a) Explain communication process with suitable diagram.

b) Explain mechanical and physical barriers.

c) Write strengths of media aided presentation.

d) Explain 'Media plays an important role in the communication processes'.

e) Write four advantages and disadvantages of oral communication.

f) Write short note on mock interview.

Q.3 Attempt any **TWO** (16)

a) Write any four principles of effective communication.

b) Write an application for the post of Design Engineer in Tata Motors, Pune. Give your resume.

P.T.O

c) Prepare a pie-chart which shows the distribution of sales of the car industry among six car companies :

General Motors	: 37%
Maruti	: 22%
Ford	: 04%
Tata	: 12%
Hyundai	: 13%
Fiat	: 12%

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EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **THIRD** PROGRAM : **INFORMATION TECHNOLOGY**
COURSE CODE :- **ITE308/IF212**
COURSE NAME :- **COMPUTER ARCHITECTURE & MAINTENANCE**
MAX. MARKS : **80** TIME : **3 HRS.** DATE: - **21 / 04 / 2017**

Instruction:-
1) Answers must be written in the main answer book provided.(and supplements if required)
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Marks

Q.1 Attempt any **FOUR** (08)

a) Define BIOS.

b) State use of CPU memory address.

c) What is mean by POST in booting process?

d) List components of system board.

e) Write any four processor's of Intel.

f) State use of heat sink.

Q.2 Attempt any **FOUR** (16)

a) Describe Hardware inside the computer case.

b) Explain primary storage devices.

c) Explain step-2 and booting process with diagram.

d) Write a note on 8 bit ISA Bus.

e) Explain attributes of CPU.

f) Write a note on SIMM & DIMM technologies.

Q.3 Attempt any **FOUR** (16)

a) Write a note on interface cards and electrical system of computer.

b) Explain three types of software and what they do?

c) Describe CPU input/output addresses.

d) List and explain types of system board.

e) Explain use of HIMEM.SYS & EMM386.EXE.

f) Draw and explain real mode vs. virtual real mode.

PTO

Q.4 Attempt any **FOUR** (08)

a) What is the need of defragmentation.?

b) List any four troubleshooting tools.

c) State the fundamental rules for PC troubleshooting

d) What is use of parallel port?

e) List any four types of UPS.

f) Define the terms voltage and current.

Q.5 Attempt any **FOUR** (16)

a) Explain Hard drive technology with neat diagram.

b) Compare SCSI & EIDE.

c) Explain in detail how we can troubleshoot printer problem?

d) List and explain problems with keyboard & monitor.

e) Draw and explain keyboard-connectors with its functions.

f) Explain AC & DC current with its function

Q.6 Attempt any **FOUR** (16)

a) Explain following Dos commands to manage a Hard drive with example.
i) UNFORMAT ii) PATH iii) MIRROR iv) ATTRIB.

b) How Hard drives partitions can be done? Explain in detail.

c) Explain troubleshooting of power supply.

d) Explain following terms i) USB ii) UART Chip.

e) Explain working of monitors.

f) Explain following things with respect to electricity and power suppliers.
i) Hot ii) Neutral iii) Ground.

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EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **FIRST** PROGRAM : **EE/IE/IT/E & TC**
COURSE CODE :- **CCF104/CCE104/X109/X103**
COURSE NAME :- **CHEMISTRY OF ENGINEERING MATERIALS**
MAX. MARKS : **80** TIME : **3 HRS.** DATE: - **24 / 04 / 2017**

Instruction:-
1) Answers must be written in the main answer book provided.(and supplements if required)
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Marks

Q.1 Attempt any **FOUR** (08)

a) Write any two differences between atomic number and atomic mass number.
b) State Pauli's exclusion principle.
c) Define i) Electrolyte ii) Electroplating.
d) State Faraday's first law of electrolysis.
e) State any two factors affecting rate of atmospheric corrosion.
f) Draw diagram of galvanizing method of protection of metal from corrosion.

Q.2 Attempt any **FOUR** (16)

a) Write orbital electronic configuration of following elements

$_{20}Ca^{40}$ $_{17}Cl^{35}$ $_{24}Cr^{52}$ $_{11}Na^{23}$

b) Explain formation of CO_2 molecule.

c) Explain the types of oxide film in atmospheric corrosion.

d) Write any four differences between Temporary hardness and permanent hardness.

e) Explain with reaction bleaching powder method of chlorination used for sterilization of water.

f) i) State any two applications of p^H. ii) Draw p^H scale.

Q.3 Attempt any **FOUR** (16)

a) Define degree of ionization. Explain any three factors affecting degree of ionization.

b) Explain mechanism of electrolysis of $CuSO_4$ solution by using copper electrode.

c) What is metal cladding process? Draw diagram of metal cladding process and write two limitations of it.

d) State and explain any four disadvantages of scale formation in boiler.

e) State any two disadvantages each of hard water in i) paper industry and ii) Sugar industry.

f) Write principle of ion exchange method used for removal of hardness from water. How exhausted Cation exchangers are regenerated?

P.T.O.

Q.4 Attempt any **FOUR** (08)

a) With example write classification of batteries.

b) Write with formula four ores of copper.

c) Define i) Flux ii) Mineral.

d) Define Alloy & write its classification.

e) Write two applications of silicon carbide.

f) Write two properties of Teflon.

Q.5 Attempt any **FOUR** (16)

a) With labelled diagram write construction and working of lead acid storage cell.

b) With the labelled diagram explain froth floatation process.

c) Explain calcination method with chemical reactions.

d) Write with example four purposes of making alloy.

e) Write four properties and two applications of Germanium

f) With example explain addition polymerization.

Q.6 Attempt any **FOUR** (16)

a) Define i) Battery ii) Separator iii) Electrochemical couple iv) Charge.

b) With diagram explain smelting process of extraction of copper.

c) Write occurrence of metals in nature. Draw flow chart of metallurgical process.

d) Write composition and two applications of Rose metal.

e) Define polymer and insulators. Write preparation of glass wool.

f) Write four characteristics of good adhesives. Write two uses of Thermocole.

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GOVERNMENT POLYTECHNIC, KOLHAPUR – 416004.

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EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **THIRD** PROGRAM : **INFROMATION TECHNOLOGY**
COURSE CODE :- **ITE303**
COURSE NAME :- **DATA COMMUNICATION**
MAX. MARKS : **80** TIME : **3 HRS.** DATE: - **24/ 04 / 2017**

Instruction:-
1) Answers must be written in the main answer book provided.(and supplements if required)
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Marks

Q.1 Attempt any **FOUR** (08)

a) List down components of data communication system.

b) Explain the terms period and frequency of a signal.

c) Name three types of transmission impairments.

d) Enlist line coding schemes.

e) A system is using NRZ-I to transfer 10 Mbps data. What are the average signal rate and minimum bandwidth?

f) Define serial transmission.

Q.2 Attempt any **FOUR** (16)

a) Write the difference between half-duplex and full-duplex transmission modes.

b) Explain Shannon capacity for a noisy channel with example.

c) Name four basic network topologies? Explain any two details.

d) Distinguish between baseband transmission and broadband transmission.

e) What do you mean by delta modulation in terms of analog to digital conversion?

f) Explain parallel transmission mode in detail.

Q.3 Attempt any **FOUR** (16)

a) How Data representation is done in communication model?

b) Explain Nyqist bit rate for noiseless channel with example.

c) Suppose a signal travels through a transmission medium & its power is reduced to one half. Calculate the attenuation of the signal. Calculate the amplification if signal power is increased 10 times.

d) With neat diagram explain NRZline coding scheme.

e) Describe the characteristics of line coding schemes.

f) Explain pulse code modulation (PCM) in detail.

PTO.

Q.4 Attempt any **FOUR** (08)

a) What is a carrier signal? What is its role in analog transmission?

b) Explain the term flow control.

c) State the property of cyclic code.

d) What is fixed size framing?

e) Draw a neat diagram of wavelength division multiplexing.

f) How does Hamming distance help in error detection during data transmission?

Q.5 Attempt any **FOUR** (16)

a) Explain Frequency division Multiplexing with neat diagram.

b) Explain general method of error correction with diagram.

c) i) Explain the term forward error correction. (02)

ii) Distinguish between single bit error and burst error. (02)

d) With neat diagram, explain amplitude Shift Keying.

e) How does generator in encoder for hamming code calculate redundant bits for 4 bit dataword? Give example.

f) Describe simple protocol for noiseless channel.

Q.6 Attempt any **TWO** (16)

a) Describe the procedure of error detection using simple parity check code with neat block diagram.

b) i) Why is sequence number necessary for a frame for noisy channels? (04)

ii) How many sequence numbers are used to number the frames in stop and wait Automatic Repeat Request protocol? Justify your answer. (04)

c) i) Explain Amplitude Modulation with diagram. (04)

ii) Explain frequency shift keying with diagram. (04)

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GOVERNMENT POLYTECHNIC, KOLHAPUR – 416004.

(An Autonomous Institute of Govt. Of Maharashtra)

EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **THIRD** PROGRAM : **INFORMATION TECHNOLOGY**
COURSE CODE :- **ITE310/ IT209**
COURSE NAME :- **SYSTEM PROGRAMMING**
MAX. MARKS : **80** TIME : **3 HRS.** DATE: - **02 / 05 / 2017**

Instruction:-
1) Answers must be written in the main answer book provided.(and supplements if required)
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Marks

Q.1 Attempt any **FOUR** (08)

a) Enlist components of programming system.

b) State operating system functions and facilities.

c) What is mean by forward reference?

d) Define static binding.

e) Write syntax of assembly language statement format.

f) Define macro expansion.

Q.2 Attempt any **FOUR** (16)

a) Describe formal systems.

b) Explain operation of grammer to generate a valid sentence.

c) Draw and explain a neat diagram to show schematic of program execution.

d) Explain overview of two pass assembly.

e) Describe design specification of an assembler.

f) Explain lexical substitution of positional parameter of macro with example.

Q.3 Attempt any **FOUR** (16)

a) Explain flow of control during macro expansion.

b) What are the advantages of assembly language? Give example.

c) Which data structures are used in synthesis and analysis phase of assembler? What is their purpose?

d) Explain classification of grammer.

e) Draw and explain back end of toy compiler.

f) Explain evolution of operating system.

P.T.O

Q.4 Attempt any **FOUR** (08)

a) Define data types and data structures.

b) What are aspects of compilation?

c) What is linking?

d) Define profile monitor.

e) Discuss program entry and editing.

f) What does mean by user interface?

Q.5 Attempt any **FOUR** (16)

a) Describe static and dynamic memory allocation?

b) Explain local optimization.

c) What is control transfer?

d) Discuss external referencing and public definition.

e) Discuss program testing and debugging.

f) Explain screen editors and word processors.

Q.6 Attempt any **FOUR** (16)

a) Describe triples, Quadruples.

b) Explain use of interpreter and its overview.

c) Explain the connect of program relocation.

d) What a note on self relocating program?

e) Discuss user interface management system.

f) Explain programming environments and its components

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GOVERNMENT POLYTECHNIC, KOLHAPUR 416004.

(An Autonomous Institute of Govt. of Maharashtra)

EVEN TERM END EXAM APRIL/MAY -2017

EXAM SEAT NO. | | | | | | |

LEVEL: **FIRST** PROGRAM: **COMMON**

COURSE CODE: **CCF110/CCE110/X111/R112** COURSE NAME: **APPLIED MECHANICS**

MAX. MARKS: **80** TIME: **3 HRS.** DATE: **02/05/2017**

Instruction:-

1) Answers must be written in the main answer book provided. (and supplements if required)
2) Figure to the right indicates marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Q.1 Attempt any **FOUR** **Marks (08)**

a) Define concurrent force system with any one of field example.

b) State polygon law of forces.

c) Explain funicular polygon with its use.

d) State any two laws of friction.

e) Explain the relationship between angle of friction & angle of Repose.

f) Draw free body diagram of body resting on rough inclined surface.

Q.2 Attempt any **FOUR** **(16)**

a) Resolve the 200N force along 30^0 & 20^0 on either side with neat sketch.

b) Find resultant in magnitude & direction of forces 1kN, 2kN, 3kN, 4kN, 5kN and 6kN acting from center of hexagon towards its angular points respectively. (solve by analytical method)

c) Solve Q.No.2 (b) by graphical method.

d) An electric bulb of 5N weight is hanging from ceiling. Its wire is pulled by a force acting horizontally such that the wire makes an angle of 60^0 with ceiling. Find the magnitude of pulled force & tension in the wire.

e) Find the support reaction of beam ABCD supported at 'A' & 'C' & portion CD is overhang. The given span is AB=BC=2m & CD=1.5m. The UDL of 20kN/m is acting on 'B' to 'D' with downward point load of 50kN acting at point D free end.

f) The body of weight 100N will begin to slide when horizontal plane is raised gradually upto 22^0. What is horizontals force required to drag the same body.

Q.3 Attempt any **FOUR** **(16)**

a) The forces 50N, 30N, 20N & 15N are acting on four sides of 10cm square box respectively on clockwise direction. Find resultant from force & locate from 50N side.

b) Three forces are acting along three side of an equilateral triangle of side 2m with forces 15N, 20N & 10N respectively. Find resultant from force of side 10N.

c) A solid sphere of radius 10cm weighing 1.2KN is hung with steel cable 50cm from vertical smooth wall to its center. Find the contact force between wall & solid sphere & tension in cable.

P.T.O

d) Beam AB of span 6m is hinged at A & roller support at B carrying vertically downward point load of 12kN at 2m from support A & inclined point load of 10kN inclined at 30^0 anticlockwise from horizontal at 4m from support A, Also udl of 5kN/m is acting over entire span. Calculate support reaction by analytical method.

e) Solve Q.No.3 (d) by graphical method.

f) A ladder of 3.5m with weight 150N is rested on smooth vertical wall & rough horizontal surface with 18^0 inclination to horizontal. What is force (pull) required at horizontal contact surface to keep ladder in equilibrium when man weighing 750N stands on its mid length. Take coefficient of friction between rough horizontal surface is 0.25.

Q.4 Attempt any **FOUR** **(08)**

a) Define Rectilinear motion.

b) Differentiate displacement & distance.

c) Define angular velocity.

d) Define energy.

e) Define work done by torque.

f) State law of machine with meaning of each notation.

Q.5 Attempt any **FOUR** **(16)**

a) A composite section as shown in figure in which a equilateral triangle is rested on a square. Determine centroidal position of the section from reference axes X& Y

b) A circular disc of 500mm diameter is cut off from a sheet of radius 500mm find the centroid of the remainder portion from reference axes X&Y as shown in figure.

c) A car staring from rest & increases speed from 0 to 10m/s with constant acceleration 0.5 m/sec^2 runs at this speed for a time of 30 seconds & finally comes to rest, with deceleration of 0.3m/sec^2. Find the total distance travelled by car.

d) A wheel moves from 200rpm to 150 rpm in 10 seconds find the retardation & time required to come to stop.

e) A bullet weighing 1N is fired with velocity 400m/sec. into a wooden block weighing 100N. If the bullet remains embedded in the block, calculate the velocity of the block after impact.

f) In a simple lifting machine 100N is lifted by an effort of 8N at an efficiency 62.5%. Find the effort lost in friction & the load lost in friction.

Q.6 Attempt any **FOUR** **(16)**

a) Determine center of gravity of a solid composite body as shown in figure from the base of body.

b) A stone is dropped into well. Its sound is heard after 3 seconds. The velocity of sound is 320 m/sec. find the depth of well.

c) A wheel starts from the rest & accelerates at 15 red/sec^2 until it reaches a speed of 300 rpm. With this speed it rotates for 3 minutes & then retards uniformly for 150 seconds & stops. Find total number of revaluations made.

d) In a simple lifting machine the effort required to lift a certain load is 150N. When efficiency is 65%. Find ideal effort of machine.

e) A simple lifting machine lifts a load of 400N & 600N by efforts of 60N & 80N respectively. Find law of machine & efficiency at a load of 800N if velocity ratio of machine is 22.

f) 300 cubic meters of water is to be raised to a tank of height 10 meters in 10 minutes. Calculate the power of the pump required in kilowatt.

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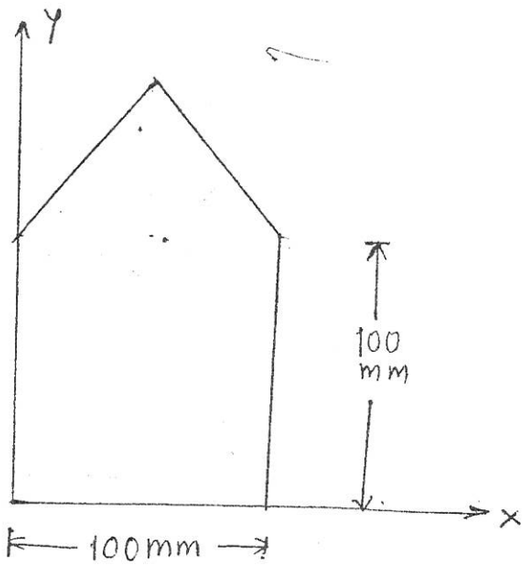
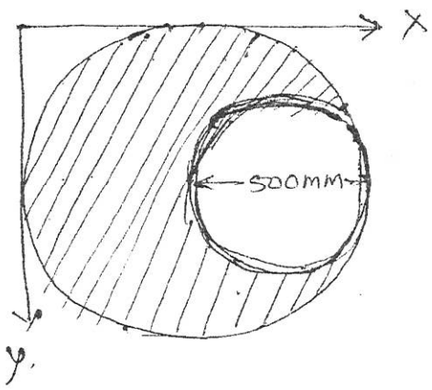
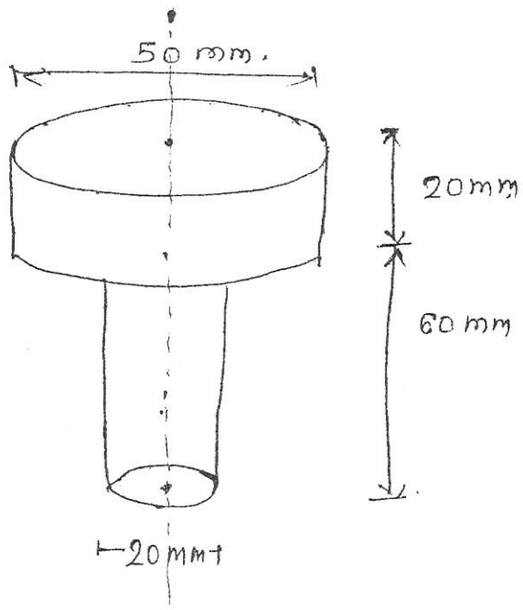
Q.5)
a)



Q.5)
b)



Q.6) a)



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EVEN TERM END EXAM APRIL/MAY -2017

EXAM SEAT NO. | | | | | | |

LEVEL: **FIRST** PROGRAM: **COMMON**

COURSE CODE: **CCF105/CCE105/X104/R107/107** COURSE NAME: **BASIC MATHEMATICS**

MAX. MARKS: **80** TIME: **3 HRS.** DATE: **09/05/2017**

Instruction:-

1) Answers must be written in the main answer book provided. (and supplements if required)
2) Figure to the right indicates marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Q.1 Attempt any **FOUR** **Marks (08)**

a) Resolve into partial fraction $\frac{1}{x^2 - x}$

b) If $A = \begin{bmatrix} 2 & -1 & 1 \\ 3 & -4 & 0 \end{bmatrix}$ & $B = \begin{bmatrix} 0 & 2 \\ -3 & 1 \\ 4 & -1 \end{bmatrix}$ is the matrix AB is non singular.

c) Evaluate i) ${}^{7}P_{3}$ ii) ${}^{4}C_{3}$

d) Solve the equations by matrix method

$3x + y = 1$

$5x + 2y = 3$

e) Expand the following binomial upto 4th term of the expansion $(1+2x)^{1/2}$

f) Expand $(x+y)^5$ by using binomial theorem.

Q.2 Attempt any **FOUR** **(16)**

a) Find k if $\begin{vmatrix} 2-k & 7 \\ 3 & -4 & 13 \\ 8 & -11 & 33 \end{vmatrix} = 0$

b) Resolve into partial fraction $\frac{x^3 + x}{x - 9}$

c) If $A = \begin{bmatrix} 2 & 4 & 4 \\ 4 & 2 & 4 \\ 4 & 4 & 2 \end{bmatrix}$ show that A^2-8A is a scaler matrix.

d) Resolve into partial fraction $\frac{x^2 + x + 1}{(x-1)^3}$

e) If $A = \begin{bmatrix} 2 & -3 \\ 3 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 4 & 5 \\ 3 & -2 \end{bmatrix}$, $C = \begin{bmatrix} 3 & -1 \\ 0 & 6 \end{bmatrix}$ Find 3A+4B-2C

f) Find x and y if $\left\{4\begin{bmatrix} 1 & 2 & 0 \\ 2 & -1 & 3 \end{bmatrix} - 2\begin{bmatrix} 1 & 3 & 1 \\ 2 & -3 & 4 \end{bmatrix}\right\}\begin{bmatrix} 2 \\ 0 \\ -1 \end{bmatrix} = \begin{bmatrix} x \\ y \end{bmatrix}$

Q.3 Attempt any **FOUR** **(16)**

a) Solve the equations by Cramer's rule

$x + y + z = 3$

$x - y + z = 1$

$x + y - 2z = 0$

P.T.O

b) Resolve into partial fraction $\frac{2x+1}{x^2(x+1)}$

c) If $A=\begin{bmatrix}1 & -3\\ 2 & -1\end{bmatrix}$ & $B=\begin{bmatrix}1 & 0 & 1\\ 2 & -1 & 3\end{bmatrix}$ *verify that* $(AB)^T = B^T A^T$

d) Resolve into partial fraction $\frac{2x+3}{x^2-2x-3}$

e) Show that $\left(\sqrt{3}+1\right)^5 - \left(\sqrt{3}-1\right)^5 = 152$

f) Solve the equation using matrix method

$x+y+x=2$

$y+z=1$

$x+z=3$

Q.4 Attempt any **FOUR** **(08)**

a) Prove that $\cos ec^2\theta - \cos^2\theta.\cos ec^2\theta = 1$

b) Without using calculator find $\sin 15^0$

c) If $\sin A = \frac{1}{2}$, *find* $\sin 3A$

d) Prove that $\cos 2\theta = 1-2\sin^2\theta$

e) Prove that $\sin\left(\theta+\frac{\pi}{6}\right) - \sin\left(\theta-\frac{\pi}{6}\right) = \cos\theta$

f) Find the principal value of $\cos^{-1}\left(\frac{-1}{2}\right) - \sin^{-1}\left(\frac{1}{2}\right)$

Q.5 Attempt any **FOUR** **(16)**

a) Prove that $\frac{\cos ecA}{\cos ecA-1} + \frac{\cos ecA}{\cos ecA+1} = 2\sec^2 A$

b) Prove that $\sin(A+B) = \sin A\cos B + \cos A\sin B$

c) Simplify $\frac{\cos^2(180^0-\theta)}{\sin(-\theta)} + \frac{\cos^2(270^0+\theta)}{\sin(180^0+\theta)}$

d) Prove that $\frac{\cos 3\theta}{\cos\theta} + \frac{\sin 3\theta}{\sin\theta} = 4\cos 2\theta$

e) Prove that $\frac{\sin 4A+\sin 5A+\sin 6A}{\cos 4A+\cos 5A+\cos 6A} = \tan 5A$

f) Prove that $\cos^{-1}\left(\frac{4}{5}\right) + \cos^{-1}\left(\frac{12}{13}\right) = \cos^{-1}\left(\frac{33}{65}\right)$

Q.6 Attempt any **FOUR** **(16)**

a) If A & B are obtuse angles such that $\sin A = \frac{5}{13}$ & $\cos B = \frac{-4}{5}$. Find tan(A+B)

b) prove that $\cos 3\theta = 4\cos^3\theta - 3\cos\theta$

c) Prove that $\frac{1-\tan 2\theta.\tan\theta}{1+\tan 2\theta.\tan\theta} = \frac{\cos 3\theta}{\cos\theta}$

d) Prove that $\frac{\sin 8x-\sin 5x}{\cos 7x+\cos 6x} = \sin x + \cos x.\tan\frac{x}{2}$

e) Prove that $\tan^{-1}(x)+\tan^{-1}(y) = \tan^{-1}\left(\frac{x+y}{1-xy}\right)$ *if* $xy<1$

f) Prove that $\tan^{-1}(1)+\tan^{-1}(2)+\tan^{-1}(3) = \pi$

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EVEN TERM END EXAM APRIL/MAY -2017

EXAM SEAT NO. | | | | | | |

LEVEL: **FIRST** PROGRAM: **COMMON**

COURSE CODE: **CCF107/X105/R109/CCE107**

COURSE NAME: **ENGINEERING DRAWING -I**

MAX. MARKS: **80** TIME: **4 HRS.** DATE: **04/05/2017**

Instruction:-

1) Answers must be written in the main answer book provided. (and supplements if required)
2) Figure to the right indicates marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Q.1 Attempt any **TWO** **Marks (08)**

a) On a plan of a field, a line of 1m long is represented on a drawing by a line of 5cm. construct a diagonal scale to read upto 2m and mark the length of 1m, 6 decimetres & 4cm on it.

b) Illustrate & write down application of following lines
   i) Ruled line with zigzag.
   ii) Short dashed medium.

c) Construct a scale of 1cm=0.4m to show metres & decimetres and large enough to measure upto 5m. Show a distance of 4m & 6 decimetres on it.

Q.2 Attempt any **FOUR** **(16)**

a) Construct an ellipse when the distance of focus from directrix is equal to 60mm & eccentricity=2/3.

b) The length of a top view of a straight line AB parallel to V.P & inclined at 40^0 to HP is 60mm. Its end A is 10mm above H.P is and 25mm infront of V.P. Draw front & Top views & determine the true length of the line AB.

c) Draw the projections F.V & T.V of a 75mm long straight line, inclined at 60^0 to V.P and its one end 15mm in front of it, parallel to and 25mm above H.P.

d) The top view of a 75mm long line measures 55mm. The line is in V.P, its one end being 25mm above the H.P. Draw its projections (F.V. and T.V)

e) End A & B of a line AB is 15mm & 55mm respectively infront of the V.P Elevation length of line is 60mm. it is parallel to XY line & 15mm above it. Draw Two views of the line & find its true length & inclination with V.P

f) The distance between the projectors through the ends of a line 75mm long is 60mm. Its end M is 15mm above HP & 20mm infront of V.P. Draw its two views when it is parallel to V.P. Determine its inclination with H.P.

Q.3 Attempt any **FOUR** **(16)**

a) Draw an Archemedian spiral of one convolution, the maximum & minimum radii being 80mm & 20mm respectively.

b) Draw a Helix on a cylinder of 50mm diameter of two turns, given pitch equal to 40mm.

c) A disc of diameter 50mm rolls without slip on a plane inclined at an angle of 15^0 to the horizontal. Trace & name the locus of point P on the circumference of the disc.

d) Draw in involute of a hexagon of side 20mm for one complete turn.

P.T.O

e) Draw a hyperbola with asymptotes OB=140 & OA=130 intersecting at an angle of 70^0 and passing trough point P on the curve 36mm from OB & 20mm from OA.

f) A stone is thrown upwards from a building 6m high & in its highest point of flight, it just crosses palm tree 12m high. Trace the path of the projectile, if the distance between the building and the palm tree be 3m. Take suitable scale.

Q.4 Attempt any **TWO** **(08)**

a) A circular plate 50mm diameter has its center 30mm above HP & 35mm infront of VP. Draw the three views of the plate when the surface is perpendicular to VP & inclined at 45^0 to HP.

b) A rhombus having diagonals 60mm & 30mm respectively is resting on a corner in VP. The longer diagonal is parallel to HP & inclined to VP such that front view appears as a square. Determine the angle made by the rhombus with VP.

c) A pentagonal plane of side 30mm is resting on HP on one of its side with the corner opposite to that side, 25mm above HP side on HP is perpendicular to VP. Draw three views of the pentagonal plane & find its inclination with HP.

Q.5 Attempt any **TWO** **(16)**

a) A cone of 50mm diameter & axis 70mm long is resting on HP on a point of its circumference of base such that its axis is parallel to VP & apex is 50mm above HP. Draw its projections.

b) A pentagonal prism base 20mm side & axis 55mm long, is standing on a corner of its base on HP with its axis inclined at 45^0 to HP & parallel to VP. Draw its projections.

c) A hexagonal pyramid base 25mm sides & axis 60mm long has a corner of base in the HP. Its axis makes an angle of 30^0 with HP & parallel to VP. Draw its projections.

Q.6 Attempt any **TWO** **(16)**

a) A hexagonal pyramid base 30mm side & axis 70mm long has its base on HP with an edge of base parallel to VP. A section plane perpendicular to VP & inclined at 45^0 to HP cuts the axis of pyramid 30mm from the apex.
Draw-
   i) Front view (02 marks)
   ii) Sectional top view (03 marks)
   iii) True shape of section. (03 marks)

b) A cylinder of 50mm diameter & axis 70mm long has its axis perpendicular to HP. It is cut by a section plane perpendicular to VP & inclined at 45^0 to HP & intersecting the axis 40mm above the base.
Draw-
   i) Front view (02 marks)
   ii) Sectional top view (03 marks)
   iii) True shape of section (03 marks)

c) A square prism base 40mm side & axis 80mm long, stands vertically on HP with the edges of the base equally inclined to VP. A section plane perpendicular to VP & inclined at 60^0 to HP cuts the axis of prism 15mm from its top end.
Draw-
   i) Front view (02 marks)
   ii) Sectional Top view (03 marks)
   iii) True shape of section. (03 marks)

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EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **FOURTH** PROGRAM : **INFORMATION TECHNOLOGY**

COURSE CODE :- **ITE403**

COURSE NAME :- **DATA STRUCTURE**

MAX. MARKS : **80** TIME : **3 HRS.** DATE :- **03 / 05 / 2017**

Instruction :-

1) Answer to two sections must be written in separate section answer book provided.
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available o request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Section – I Marks

Q.1 Attempt any **FOUR** (08)

a) What is abstract data type?

b) State the difference between Direct and Indirect recursion.

c) Define searching.

d) State basic operations of stack.

e) Convert following infix expression to Prefix & Postfix. (A+B) * (C + D).

f) What is mean by double ended queue?

Q.2 Attempt any **FOUR** (16)

a) Describe Big 'O' Notation & Omega (Ω) notations.

b) Consider an integer array

14	33	27	35	10

Show & explain the status of array during each pass of Bubble sort.

c) Write Pseudocode for insertion sort.

d) Convert following Infix expression to Prefix & Postfix

((A+B) * C) – ((D-E) * (F+G))

e) Explain FIFO structure of queue with example.

f) Write a note on applications of queue.

Q.3 Attempt any **FOUR** (16)

a) Explain constants and their storage representation.

b) Write and explain algorithm for linear search with example.

c) Explain how merge sort works with example.

d) Describe representation of stack through arrays.

e) Write a C/CPP program to find factorial of a given number using Recursion.

f) Explain the concept of priority queue with example.

P.T.O.

Section – II	Marks

Q.4 Attempt any **FOUR** (08)

a) Define linked list.

b) What is meant by descendant in tree?

c) Define term Adjancey matrix.

d) What is meant by complete graph?

e) What is use of hashing?

f) Write in short the term hash address.

Q.5 Attempt any **FOUR** (16)

a) Write a C program that implements push and pop operation on stack using linked list.

b) Explain the insertion and deletion operation on circular linked list with example.

c) Explain following traversing method of binary tree: i) Preorder ii) Post order.

d) Write and explain following term with example i) ancestor ii) binary search tree.

e) Explain path matrix in detail and also draw any path matrix of suitable path.

f) Explain in detail folding methods of hash function.

Q.6 Attempt any **FOUR** (16)

a) Explain the implementation of Queue using linked list.

b) Write a C program to implement following operation on linked list

i) Insertion ii) Searching.

c) Explain any two operation on binary tree.

d) Explain linked list representation of graph.

e) Explain following term; related to graph :

i) Vertex ii) Edge iii) Indegree iv) Outdegree.

f) Write a C++ program to add, search and delete using any hash function.

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EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **THIRD** PROGRAM : **INFORMATION TECHNOLOGY**
COURSE CODE :- **ITE304**
COURSE NAME :- **OOP USING C ++**
MAX. MARKS : **80** TIME : **3 HRS.** DATE: - **27 / 04 / 2017**

Instruction:-
1) Answers must be written in the main answer book provided.(and supplements if required)
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Marks

Q.1 Attempt any **FOUR** (08)

a) Enlist applications of OOP.

b) Draw structure of C++ program.

c) What do you mean by default argument?

d) What is function?

e) Define static member function.

f) What is constructor?

Q.2 Attempt any **FOUR** (16)

a) Explain scope resolution operator with example.

b) Explain function overloading with example.

c) Explain Friend Function with suitable example.

d) How to make outside function Inline? Explain with example.

e) Define parameterized constructor. Give example.

f) Explain dynamic initialization of objects.

Q.3 Attempt any **FOUR** (16)

a) What are the manipulators in C++?

b) What is inline function? Explain its purpose.

c) How to make arrays of object in C++?

d) How to define member function in C++?

e) Explain destructor with example.

f) How to use default arguments in constructor?

P.T.O.

Q.4 Attempt any **FOUR** (08)

a) Enlist file mode parameters. State their meaning. (any two)

b) Define operator overloading.

c) Write use of get ( ) and put ( ) functions.

d) Write syntax of operator function.

e) Explain the term-abstract class.

f) State operators that can not be overloaded using friend function.

Q.5 Attempt any **FOUR** (16)

a) Explain single inheritance with example.

b) State rules for overloading operators (any four)

c) Explain syntax and use of i) precision ( ) ii) fill ( ).

d) Write a C++ program to demonstrate arithmetic operations on pointers.

e) i) What is dynamic binding? (02)

ii) What is pure virtual function? (02)

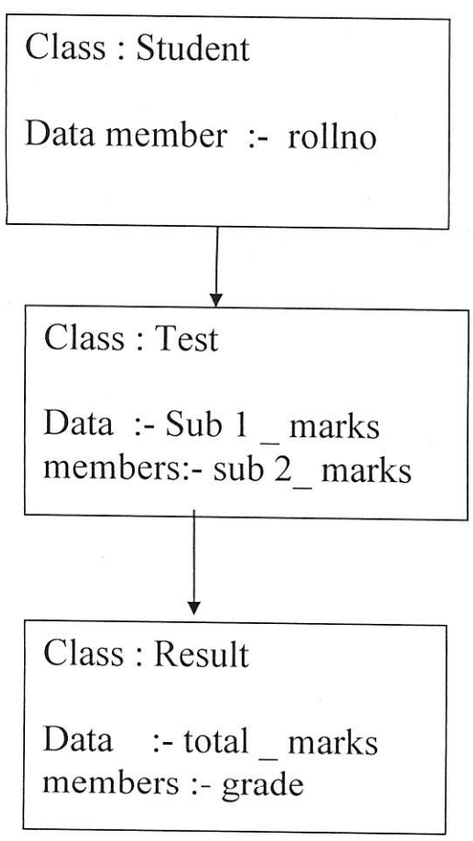
f) Explain two ways of opening a file.

Q.6 Attempt any **TWO** (16)

a) i) Enlist rules for virtual functions. (04)
ii) Explain pointer to object with example. (04)

b) i) Write a C++ program to overload unary minus (-) operator using friend function. (04)
ii) Explain overloading binary operator using member functions with example. (04)

c) Identify following inheritance and implement it
(Assume necessary member functions)



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GOVERNMENT POLYTECHNIC, KOLHAPUR – 416004.

(An Autonomous Institute of Govt. Of Maharashtra)

EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **FIRST** PROGRAM : **INFORMATION TECHNOLOGY**

COURSE CODE :- **ITF102 / ITE104**

COURSE NAME :- **C PROGRAMMING**

MAX. MARKS : **80** TIME : **3 HRS.** DATE: - **28 / 04 / 2017**

Instruction:-

1) Answers must be written in the main answer book provided.(and supplements if required)
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Marks

Q.1 Attempt any **FOUR** (08)

a) What is C character set?

b) Enlist arithmetic operators in C.

c) What is the purpose of gets ( )?

d) Enlist logical operators in C.

e) Write the syntax and flowchart of switch statement.

f) Define function.

Q.2 Attempt any **FOUR** (16)

a) What are variables? Explain the syntax for declaration of variables.

b) Explain Assignment operator in detail with example.

c) Differentiate between break and continue with example.

d) Explain nested if-else with example.

e) Explain call by value and call by reference with example.

f) Write a note on recursion function.

Q.3 Attempt any **FOUR** (16)

a) Explain the basic structure of C program.

b) Explain printf ( ) function in detail with example.

c) Explain for ( ) loop in detail with example.

d) Write a program to print Fibonacci Series.

e) What are the benefits of use defined function?

f) Explain function call statement with example.

P.T.O.

Q.4 Attempt any **FOUR** (08)

a) Explain strcpy ( ) string function.

b) Write syntax of declaring one dimensional array.

c) Give syntax of structure definition.

d) Define array.

e) Define pointers.

f) Give the management of :-

```
int * ptr;
int  a;
ptr = &a;
```

Q.5 Attempt any **FOUR** (16)

a) Explain with syntax and example strcmp ( ) and strlen ( ) function.

b) Explain how string variables are declared and initialized.

c) Write a program for multiplication of two 3 X 3 matrix.

d) Write a program to find largest number in 3 (three) element integer array.

e) Write program to swap two integer numbers using pointer.

f) Write a program to declare structure Book having data member name, Author name, price, accept this data and display it.

Q.6 Attempt any **FOUR** (16)

a) What is two dimensional array? How it is declared and initialized?

b) Explain accessing structures that contain arrays with example.

c) Explain the syntax of example of strcat ( ) and strupr ( ) string functions.

d) Explain array of structure with example.

e) Write a program to concatenate two strings and display the length of the concatenated string.

f) Write a C program to calculate sum of all elements of an integer array.

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GOVERNMENT POLYTECHNIC, KOLHAPUR – 416004.

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EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **THIRD** PROGRAM : **INFORMATION TECHNOLOGY**

COURSE CODE :- **ITE305/IT206/IF206**

COURSE NAME :- **DATABASE MANAGEMENT SYSTEM**

MAX. MARKS : **80** TIME : **3 HRS.** DATE: - **28 / 04 / 2017**

Instruction:-

1) Answers must be written in the main answer book provided.(and supplements if required)
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Marks

Q.1 Attempt any **FOUR** (08)

a) Define term i) Primary key ii) candidate key.

b) Define Query language.

c) What are the various operators in SQL?

d) Draw block structure of PL SQL.

e) List types of mapping cardinalities.

f) Define relational database system.

Q.2 Attempt any **FOUR** (16)

a) List various symbols used to sketch ER diagram with their meaning.

b) Explain any two string function of SQL with example.

c) Explain following DML with suitable example

i) procedural DML ii) non procedural DML.

d) How to use function in PL/SQL? Explain with example.

e) Explain outer join with example.

f) Write a note on 'user defined exception handling'.

Q.3 Attempt any **FOUR** (16)

a) Explain selection and projection in relational database.

b) Write note on DBMS Vs file system.

c) Explain syntax for creating trigger in PL/ SQL. Give example.

d) Explain Null constraints with example.

e) How Data type can be converted into various formats?

f) Write a program using while loop to find value of A raised B (A^B)

P.T.O.

Q.4 Attempt any **FOUR** (08)

a) Enlist the measures of query cost.

b) What is lock compatibility matrix?

c) Define time-stamp.

d) What is mean by a starving of a transaction?

e) Define logical error and system error.

f) State different storage types.

Q.5 Attempt any **FOUR** (16)

a) Describe the normalization of database using 2NF with example.

b) Illustrate ACID properties of transaction?

c) Write the concept of conflict serializability.

d) Explain the concept of deadlock with example.

e) Describe validation based protocol.

f) Write a note on failure of a transaction.

Q.6 Attempt any **TWO** (16)

a) Write a note on 3NF & BCNF with example.

b) Describe various states of transaction.

c) Explain log based recovery.

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GOVERNMENT POLYTECHNIC, KOLHAPUR – 416004.

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EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **FIRST** PROGRAM : **INFORMATION TECHNOLOGY**

COURSE CODE :- **ITE108/IF104**

COURSE NAME :- **BASIC ELECTRONICS**

MAX. MARKS : **80** TIME : **3 HRS.** DATE: - **29 / 04 / 2017**

Instruction:-

1) Answers must be written in the main answer book provided.(and supplements if required)
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Marks

Q.1 Attempt any **FOUR** (08)

a) Define insulator.

b) Draw P-N-P transistor.

c) What are the different types of semiconductor?

d) Define the term Doping?

e) Draw the equivalent circuit of transistor using diodes.

f) Draw symbol of P-N junction diode.

Q.2 Attempt any **FOUR** (16)

a) Draw a circuit diagram to explain forward biased characteristics of P-N junction diode.

b) State the factors to be considered while designing for a good transistor amplifier.

c) List out the application of P-N junction diode and Zener diode.

d) Draw and explain the operation of half wave rectifier with waveforms.

e) Draw the V-I characteristics of Zener diode.

f) Compare LC filter with C.L.C. filter.

Q.3 Attempt any **TWO** (16)

a) Draw the circuit diagram of bridge rectifier with LC type filter. Explain its operation with waveforms.

b) How will you draw d.c. load line on output characteristic curve of a transistor? Write a note on selection of 'Q' point.

c) List out the types of biasing circuit with respect to operating point and explain voltage divider bias method for transistor.

P.T.O..

Q.4 Attempt any **FOUR** (08)

a) State the applications of RC coupled amplifier.

b) Draw the pin diagram with label for 78XX IC.

c) Draw the symbol for MOSFET and JFET.

d) What is the application of 79XX voltage regulator IC?

e) Give the classification of FET.

f) How Zener diode can be used as voltage regulator.

Q.5 Attempt any **FOUR** (16)

a) Explain working of RC coupled amplifier with circuit diagram.

b) Compare JFET with BJT.

c) Draw the Block diagram of regulated power supply and explain.

d) Explain single stage amplifier with diagram.

e) Explain the working principle of JFET with diagram.

f) Draw the transistor series voltage regulator and explain the working.

Q.6 Attempt any **FOUR** (16)

a) Draw the frequency response curve and explain.

b) Explain the following JFET parameter i) D.c. drain resistance (R_{DS}) ii) Trans conductance iii) Amplication factor iv) Input resistance.

c) Explain the transistor shunt voltage regulator with diagram.

d) Draw the drain characteristics of JFET with neat labeling and explain Ohmic region and breakdown region.

e) Draw the circuit diagram for Zener diode as voltage regulator and explain working.

f) Explain the working of depletion type MOSFET in depletion mode with diagram.

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EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **FIRST** PROGRAM : **INFORMATION TECHNOLOGY**

COURSE CODE :- **ITF104**

COURSE NAME :- **BASIC ELECTRONICS**

MAX. MARKS : **40** TIME : **2 HRS.** DATE: - **29 / 04 / 2017**

Instruction:-

1) Answers must be written in the main answer book provided.(and supplements if required)
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Marks

Q.1 Attempt any **FOUR** (08)

a) Define i) Discrete ii) Non discrete iii) Active iv) Passive components.

b) Give two applications of PN junction diode.

c) Classify rectifiers, on the basis of diodes used.

d) Define coefficient of coupling.

e) Draw output V-I characteristics of PN junction diode.

f) Name general specifications of resisters.

Q.2 Attempt any **FOUR** (16)

a) Give construction of ferrite core inductor and explain it in brief.

b) Define i) Intrinsic semiconductor ii) Extrinsic semiconductor.

c) Draw construction and waveforms of single stage amplifier.

d) Explain working of shunt capacitor filer.

e) With five bands, how a value of resister can be calculated? Explain with one example.

f) List types of biasing. Why biasing is required?

Q.3 Attempt any **FOUR** (16)

a) Explain working principle of full wave rectifier. Give its i) ripple factor ii) Efficiency values.

b) Give two applications of each i) air core inductor ii) Iron core inductor.

c) Explain Zener as a voltage regulator.

d) Differentiate half ware rectifier and full wave rectifier on the basis of following points

i) No. of diodes ii) Ripple factor iii) Efficiency iv) Average value

e) How transistor can be used as a switch? Explain.

f) Draw and explain block diagram of regulated power supply

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GOVERNMENT POLYTECHNIC, KOLHAPUR 416004.

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EVEN TERM END EXAM APRIL/MAY-2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **FOURTH** PROGRAM : **INFORMATION TECHNOLOGY**

COURSE CODE :- **ITE406/IF306/IT402**

COURSE NAME :- **JAVA PROGRAMMING**

MAX. MARKS : **80** TIME : **3 HRS.** DATE :- **25 / 04 / 2017**

Instruction :-

1) Answer to two sections must be written in separate section answer book provided.
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available o request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Section – I Marks

Q.1 Attempt any **FOUR** (08)

a) Explain the term interface.

b) State use of 'import' statement.

c) Why is Java know as robust and secure?

d) What is use of finalize ( ) method?

e) When do we declare a method or class as abstract?

f) What are benefits of using packages?

Q.2 Attempt any **FOUR** (16)

a) How will you declare and initialize one dimensional arrays in Java? Give example.

b) Explain concept of method overriding with example.

c) Describe syntax for defining an interface with example.

d) Write java program to reverse elements of an integer array.

e) Explain use of labelled continue statement with example.

f) Write Java code to define a class 'student' with data members- name rollno. Derive a class 'Result' from 'student' with data member-marks. Implement methods to input and display data.

Q.3 Attempt any **TWO** (16)

a) i) Define – polymorphism. (02)
ii) What is scope of a variable which is declared as private and private protected? (02)
iii) Explain how will you add interface to a package. (04)

b) Explain steps to create your own package. Give example.

c) i) How does Java differ from C and C++? (04)
ii)Write Java program that will read value of x and evaluate following function (04)

$$y = \begin{cases} 1 & for\ x > 0 \\ 0 & for\ x = 0 \\ -1 & for\ x < 0 \end{cases}$$

Using nested if statement.

P.T.O

Section – II	Marks

Q.4 Attempt any **FOUR** (08)

a) How applet differs from application?
b) State the functions of draw i) Rectangle ii) Arc.
c) What is thread?
d) Define Exception.
e) Write any two methods of Button class along with their use and syntax.
f) Write method of color class.

Q.5 Attempt any **FOUR** (16)

a) What is Frame? How to create frame? Explain with example.

b) Explain how parameters are passed to an applet.

c) Explain awt event hierarchy?

d) Write a program to display Menubar with Menus like file, Edit and menu options like New, Open etc.

e) Explain the life cycle of thread with diagram.

f) Write in brief about Focus Listener Interface.

Q.6 Attempt any **FOUR** (16)

a) Explain i) MouseEvent class ii) WindowEvent class.

b) Describe the use of flow layout manager.

c) Write a program to input a name and age of person & throw an exception (user defined) if the entered age is negative.

d) Write a program to display 1 to 10 numbers with a delay of 500ms on an applet window.

e) How to use setBackground ( ) & SetForeground ( ) methods? Explain with example.

f) Explain applet life cycle.

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GOVERNMENT POLYTECHNIC, KOLHAPUR – 416004.

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EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **THIRD** PROGRAM : **INFORMATION TECHNOLOGY**

COURSE CODE :- **ITE307/IF208**

COURSE NAME :- **OPERATING SYSTEMS**

MAX. MARKS : **80** TIME : **3 HRS.** DATE: - **25 / 04 / 2017**

Instruction:-

1) Answers must be written in the main answer book provided.(and supplements if required)
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Marks

Q.1 Attempt any **FOUR** (08)

a) Define operating system.

b) What is context switch?

c) Draw a neat diagram of process state transition.

d) Explain the term CPU bound process.

e) What is role of bootstrap program?

f) State any two advantages of layered operating system structure.

Q.2 Attempt any **FOUR** (16)

a) How do time sharing systems work?

b) Explain system calls related to i) File management ii) Device management.

c) What are features of real time systems?

d) Explain various categories of system programs.

e) What is role of operating system in process management?

f) Which information fields are included in process control block?

Q.3 Attempt any **TWO** (16)

a) Explain features of clustered systems.

b) i) What are benefits of multithreaded programming? (04)

ii) Explain function of long-term scheduler and short-term scheduler. (04)

c) List and explain operating system services.

PTO

Q.4 Attempt any **FOUR** (08)

a) Define Through-put.

b) What is compile time Binding?

c) Enlist common file types.

d) Define Absolute path with one example.

e) Write any two advantages of caching.

f) What is mean by polling?

Q.5 Attempt any **FOUR** (16)

a) Explain priority scheduling algorithm with example.

b) Write a note on to recovery of deadlocks.

c) Explain segmentation.

d) Explain what is need of swapping.

e) Explain different operations that can be performed on files.

f) Explain in brief Blocking and Non Blocking I/O.

Q.6 Attempt any **FOUR** (16)

a) Explain SJF scheduling algorithms with example.

b) Explain following term : i) Perimitive scheduling ii) Non-perimitive scheduling.

c) Explain contiguous memory allocation methods.

d) Describe direct access file methods.

e) Write a short note on block and characteristics.

f) Explain in detail : DMA.

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GOVERNMENT POLYTECHNIC, KOLHAPUR – 416004.

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EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **FOURTH** PROGRAM : **INFORMATION TECHNOLOGY**

COURSE CODE :- **ITE410**

COURSE NAME :- **PHP**

MAX. MARKS : **80** TIME : **3 HRS.** DATE :- **26 / 04 / 2017**

Instruction :-

1) Answer to two sections must be written in separate section answer book provided.
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available o request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Section – I Marks

Q.1 Attempt any **FOUR** (08)

a) Enlist common uses of PHP.

b) What is MySQL AB?

c) Define PHP info ( ).

d) How to comment PHP code?

e) List PHP string functions.

f) What is use of preg_match ( )?

Q.2 Attempt any **FOUR** (16)

a) Explain following PHP & MySQL features
-many extensions
-fast feature development.
-Popularity
-Strong user communities.

b) Explain how to install mamp & use of it.

c) Describe client side and server side scripting.

d) Explain Assignment operator with example.

e) Describe Retrieving environment variables using HTTP_USER_AGENT.

f) Write a PHP program for displaying browser specific content.

Q.3 Attempt any **FOUR** (16)

a) Write a note on history of MySQL & PHP.

b) How to install PHP on windows.?

c) Explain how PHP code is parsed?

d) Write a note on predefine variable.

PTO

e) Create an input form for PHP string functions input form contents.
-Text fields
-Input type-radio buttons
-Submit button.

f) Write a php program for displaying platform specific content.

Section – II | Marks

Q.4 Attempt any **FOUR** (08)

a) What is file paths and permission?

b) How to create a new user in MYSQL?

c) Define BOOL.

d) State two step form sequence for creating table.

e) What is count ( )?

f) What is substr ( )?

Q.5 Attempt any **FOUR** (16)

a) Write a php program to create new file.

b) State the usage of i) r mode ii) W mode with example.

c) Explain how to create a new database in PHP.

d) List and explain any eight data types of MySQL.

e) How to supress error message in PHP?

f) Write a note on populating table in PHP.

Q.6 Attempt any **FOUR** (16)

a) Explain how to copy files in PHP.

b) State the difference between i) r & r+ ii) W & W+.

c) Describe breaking your connection script in MySQL.

d) Write a PHP program for listing database on a server.

e) Write a PHP table creation script.

f) Explain the following function with example

i) Strip slashes ( ) ii) mysql _select_db ( ),

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EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **FIFTH** PROGRAM : **INFORMATION TECHNOLOGY**

COURSE CODE :- **ITE504**

COURSE NAME :- **MULTIMEDIA TECHNIQUE**

MAX. MARKS : **80** TIME : **3 HRS.** DATE :- **27 / 04 / 2017**

Instruction :-

1) Answer to two sections must be written in separate section answer book provided.
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available o request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Section – I Marks

Q.1 Attempt any **FOUR** (08)

a) What is the digitized sound?

b) Define the term quantizing and clipping.

c) What is Clip Art?

d) What is Dithering?

e) What are the Features of 3D modeling and animation tools?

f) What are features provided by AVI?

Q.2 Attempt any **FOUR** (16)

a) Which services are offered by Quick time? Explain in detail.

b) Explain any two analog Broad Cast standards.

c) Explain Cell Animation Technique.

d) Write the difference between Vector-Drawn and Bitmaps.

e) Write down steps for adding sound to your multimedia project.

f) Explain the use of multimedia in Business and School.

Q.3 Attempt any **FOUR** (16)

a) Explain the term video conferencing and voice mails.

b) Write down the advantages of MIDI audio.

c) Define the term 3D drawing and Rendering.

d) Explain the term MPEG.

e) How the animation is made by computer?

f) What are the Features provided by painting and drawing tools?

	Section – II	Marks
Q.4	Attempt any **FOUR**	(08)

a) What is computer Based Training?

b) What is Just-in-Time Training?

c) Define object Technology.

d) What are the features of object oriented system?

e) What is Intellectual property Rights?

f) What is the role of patent?

Q.5 Attempt any **FOUR** (16)

a) Write a short note on Kiosks.

b) Explain multimedia on Desk-top.

c) What are the human factors on multimedia application?

d) Explain object management architecture with diagram.

e) Write a short note on tools for multimedia object.

f) Explain electronic Trading.

Q.6 Attempt any **TWO** (16)

a) Explain Multimedia and single user.

b) Explain multimedia data management using an object-oriented database.

c) Write a short note on i) Copyright ii) Errors and inaccuracies in multimedia.

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GOVERNMENT POLYTECHNIC, KOLHAPUR – 416004.

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EVEN TERM END EXAM April/ May 2017

EXAM SEAT NO. | | | | | | |

LEVEL : - **THIRD** PROGRAM : **INFORMATION TECHNOLOGY**

COURSE CODE :- **ITE313**

COURSE NAME :- **COMPUTER GRAPHICS**

MAX. MARKS : **80** TIME : **3 HRS.** DATE: - **05 / 05 / 2017**

Instruction:-

1) Answers must be written in the main answer book provided.(and supplements if required)
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Marks

Q.1 Attempt any **FOUR** (08)

a) Define resolution.

b) What is importance of homogeneous coordinate matrix?

c) What is function of display file interpreter?

d) State advantages and disadvantages of DDA algorithm for line drawing.

e) Write 2D translation matrix. State its meaning.

f) What is principle of seed fill algorithm?

Q.2 Attempt any **FOUR** (16)

a) Explain working of CRT monitor with neat diagram.

b) Define X shear and y shear. Explain 2D shearing with example.

c) Explain flood fill algorithm for polygon filling.

d) Explain 2D scaling transformation along with its matrix.

e) To draw a line from point (5,5) to point (10,10) using DDA line drawing algorithm, calculate intermediate pixel positions.

f) Explain rotation of an object about an arbitrary point.

Q.3 Attempt any **TWO** (16)

a) i) Explain syntax of following C graphics functions

1) initgraph ( ) 2) drawarc ( ) (04)

ii) List applications of computer graphics. (04)

b) Write and explain DDA circle generation algorithm.

c) With example, explain 3D rotation.

P.T.O.

Q.4 Attempt any **FOUR** (08)

a) Define viewport.

b) State any one approach of curve generation.

c) State any one disadvantage of arc generation using DDA.

d) Enlist different graphics standards.

e) Define windowing.

f) Define clipping.

Q.5 Attempt any **FOUR** (16)

a) Write Sutherland- Hodgmen polygon clipping algorithm.

b) Describe normalization transformation.

c) Write algorithm for arc generation using DDA.

d) Enlist characteristics of Bsp line curve.

e) Describe Raster Scan display.

f) What is need for graphics standards?

Q.6 Attempt any **FOUR** (16)

a) Describe viewing transformation.

b) Write mid-point subdivision line clipping algorithm.

c) Write Cohen-Sutherland line clipping algorithm.

d) Explain Bezeir curve with neat diagram.

e) State advantages and disadvantages of Random and Raster Scan display.

f) What are advantages of graphics standard?

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GOVERNMENT POLYTECHNIC, KOLHAPUR 416004.

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EVEN TERM END EXAM APRIL/MAY -2017

EXAM SEAT NO. | | | | | | |

LEVEL: **THIRD** PROGRAM: **COMMON**

COURSE CODE: **EEE305/IEE301/ETE301/ITE301/EE201/IX201/EJ201/IT201/IE201/IF201/201**

COURSE NAME: **APPLIED MATHEMATICS**

MAX. MARKS: **80** TIME: **3 HRS.** DATE: **08/05/2017**

Instruction:-

1) Answers must be written in the main answer book provided. (and supplements if required)
2) Figure to the right indicates marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Q.1 Attempt any **FOUR** **Marks (08)**

a) Evaluate $\int \left[e^{2\log x} + e^{x\log a}\right] dx$

b) Find $\int \frac{\sin\sqrt{x}}{\sqrt{x}} dx$

c) Evaluate $\int \frac{dx}{3+2x-x^2}$

d) Evaluate $\int_1^2 \frac{dx}{3x-2}$

e) Evaluate $\int_1^e \log x dx$

f) Find mean value of y=cosx over the range from $x = \frac{-\pi}{2}$ to $x = \frac{\pi}{2}$

Q.2 Attempt any **FOUR** **(16)**

a) Evaluate $\int \frac{dx}{(x^2+4)(x+1)}$

b) Evaluate $\int \frac{dx}{3\sin 2x + 2\cos 2x}$

c) Evaluate $\int \frac{x+2}{\sqrt{x^2+5x+6}} dx$

d) Evaluate $\int_0^{\pi/4} \log(1+\tan x) dx$

e) Evaluate $\int_1^3 \frac{\sqrt[3]{x+5}}{\sqrt[3]{x+5}+\sqrt[3]{9-x}} dx$

f) Using integration find the area of the circle $x^2 + y^2 = 16$

Q.3 Attempt any **FOUR** **(16)**

a) Evaluate $\int_{\pi/6}^{\pi/3} \frac{1}{1+\sqrt[n]{\cot x}} dx$

b) Evaluate $\int \frac{3\sin x + 4\cos x}{2\sin x - \cos x} dx$

P.T.O

c) Evaluate $\int \cos\sqrt[3]{x}\, dx$

d) Evaluate $\int \frac{dx}{4\cos^2 x + 9\sin^2 x}$

e) Find R.M.S value of the I=10sin100πt over a complete period.

f) Find the area enclosed by the parabola $y = x^2 - 5x + 15$ and the line $y - 3x = 3$.

Q.4 Attempt any **FOUR** **(08)**

a) From the differential equation whose solution is y=acos3t+bsin3t

b) State order and degree of $y = \frac{dy}{dx} + \frac{c}{dy/dx}$

c) Show that $y^3 \sec^2 x\, dx + (3y^2 . \tan x - \sec^2 y)dy = 0$ is exact.

d) Find x and y satisfying the equation $(2+i)x + (i-3)y = 4$

e) Find the value of $i^{49} + i^{68} + i^{89} + i^{110}$

f) Find the complex conjugate of $\frac{3+5i}{1+2i}$

Q.5 Attempt any **FOUR** **(16)**

a) Solve: $\frac{dy}{dx} - \frac{2}{x}y = x^2 e^x$, if y=0 when x=1

b) Solve: $(e^x + 2x^2 y + y^3)dx + (a^y + 2x^2 y + 3xy^2)dy = 0$

c) Solve : $x^2 y dx = (x^3 + y^3)dy$

d) Express $1+i$ *in* $(x+iy)$ form.

e) Simplify using De Moivre's Theorem $\frac{(\cos 2\theta + i\sin 2\theta)^3 (\cos 3\theta - i\sin 3\theta)^4}{(\cos\theta + i\sin\theta)^2 (\cos 2\theta - i\sin 2\theta)^{-3}}$

f) If $\cos(x+iy) = \alpha + i\beta$ show that *i)* $\frac{\alpha^2}{\cos^2 x} - \frac{\beta^2}{\sin^2 x} = 1$ *ii)* $\frac{\alpha^2}{\cosh^2 y} + \frac{\beta}{\sinh^2 y} = 1$

Q.6 Attempt any **FOUR** **(16)**

a) Solve $\frac{dy}{dx} = \sin(x+y)$

b) Solve $\frac{dy}{dx} = \frac{xy}{(1-x)(1+y)}$

c) If the slope of the curve is $x^2 + 2x + 1$, find its equation if it passes through the point (1, 1)

d) Find 2 values of $(1-i)^{1/2}$

e) Using Euler's formula, prove the following

i) $\sin 2\theta = 2\sin\theta\cos\theta$

ii) $\cosh^2 x + \sinh^2 x = \cosh 2x$

f) Show that $\sqrt{3+i}$ is a cube root of $8i$

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GOVERNMENT POLYTECHNIC, KOLHAPUR 416004.

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EVEN TERM END EXAM APRIL/MAY -2017

EXAM SEAT NO. | | | | | | |

LEVEL: **FIRST** PROGRAM: **INFORMATION TECHNOLOGY**

COURSE CODE: **IF101** COURSE NAME: **ENGINEERING DRAWING-I**

MAX. MARKS: **80** TIME: **4 HRS.** DATE: **04/05/2017**

Instruction:-

1) Answers must be written in the main answer book provided. (and supplements if required)
2) Figure to the right indicates marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Marks

Q.1 Attempt any **TWO** **(08)**

a) 1) Draw following the line conventions.
   i) Continuous thin with zig–zags.
   ii) Cutting plane line.
   iii) Dashed medium thock.
   iv) Continuous thin wavy.

b) Construct a diagonal scale of R.F 1:20 showing divisions of 0.01m and capable of measuring 3 meters mark a distance of 2.37m on it.

c) Construct a regular pentagon of side 40mm.

Q.2 Attempt any **TWO** **(16)**

a) i) State any four principles (Rules) of dimensioning.
   ii) Dividing a line $\ell(AB) = 70mm$ in equal alone (09) parts

b) A line AB of length 80mm has its end A 20mm above the H.P. Line is parallel to V.P. and 30mm infront of V.P. and plan length is 55mm. Draw
   i) Front view (02 marks)
   ii) Top view (02 marks)
   iii) Side view (02 marks)
   iv) Find the inclination of the line with HP. (02 marks)

c) End A and B of line AB is 15mm and 55mm respectively infront of the VP Elevation length of the line is 60mm end it is parallel to the XY line and 15mm above it. Draw
   i) Front view (02 marks)
   ii) Top view (02 marks)
   iii) Side view (02 marks)
   iv) Find its true length (02 marks)

Q.3 Attempt any **TWO** **(16)**

a) Distance between the projections of ends 'A' and 'B' of line AB 75mm long is 60mm. End 'A' of the line is 15mm above the HP and 20mm infront of the VP and it is parallel to VP. Draw
   i) Front view (02 marks)
   ii) Top view (02 marks)
   iii) Side view (02 marks)
   iv) Find inclination of the line with HP (02 marks)

P.T.O. 01/04

b) A rectangular lamina ABCD of smaller side AB=30mm and longer side BC=50mm is resting on the V.P. on its smaller side AB. Lamina is inclined to V.P. in such a way that its elevation appears to be a square. Side AB is perpendicular to H.P. Draw three views of the lamina and find its inclination with V.P.

c) A circular plate of diameter 60mm is kept on the H.P. on a point of its circumference. The surface of the circular plate makes on angle of 40^0 to the H.P. and perpendicular to V.P. Draw three views.

Q.4 Attempt any **TWO** **(08)**

a) Figure.no.1 shows a pictorial view of an object. Draw its front view in the direction of Y. show necessary dimensions in it

b) Figure no.2 shows a pictorial view of an object. Draw its top view. Show necessary dimension in it.

c) Figure. no.3. Shows pictorial view of an object. Draw its sectional front view in the direction of X, section along AA.

Q.5 Attempt any **TWO** **(16)**

a) Figure. no.4. Shows pictorial view of an object. Draw its following views by first angle projection method.
   i) Front view in the direction of X (04 marks)
   ii) Right hand side view (04 marks)

b) Figure. no.5. Shows pictorial view of an object. Draw its following views by first angle projection method.
   i) Sectional front view in the direction of X, section along AA (04 marks)
   ii) Top view (04 marks)

c) Figure. no.6. Shows pictorial view of an object. Draw its following views by first angle projection method.
   i) Front view in the direction of X (04 marks)
   ii) Left hand side view (04 marks)

Q.6 Attempt any **TWO** **(16)**

a) Figure no.7 shows front view and left hand side view of an object. Draw its isometric view taking 'O' as an origin.

b) Figure no.8 shows front view and top view of an object. Draw its isometric projections, taking 'O' as an origin. Use isometric scale.

c) Figure no.9 shows front view and top view of an object. Draw isometric view, using natural scale. Take 'O' as an origin.

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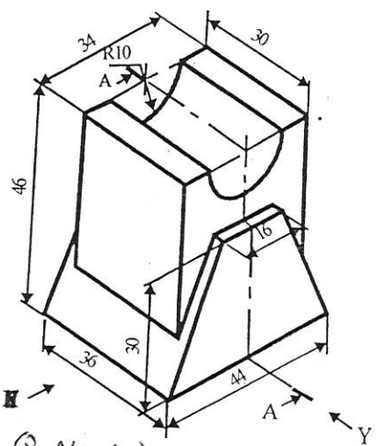
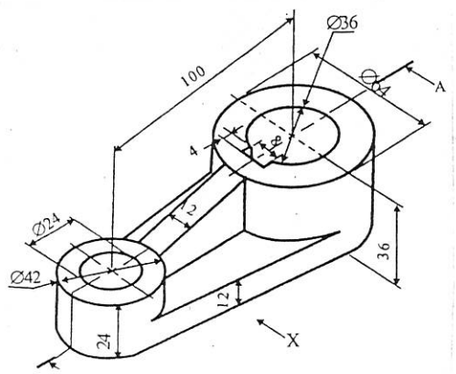
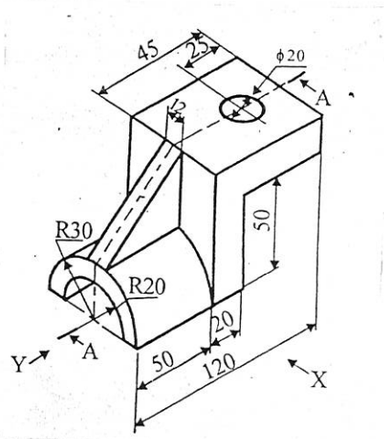


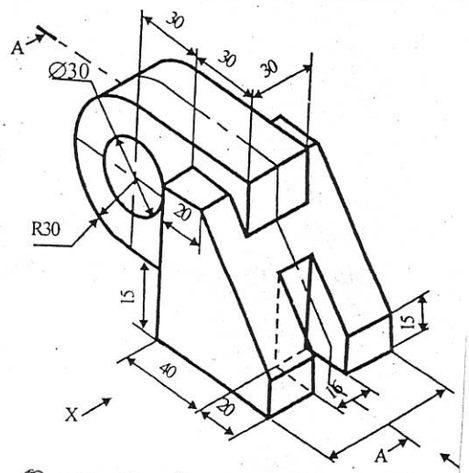
Q.No.4.a) Fig.No.1



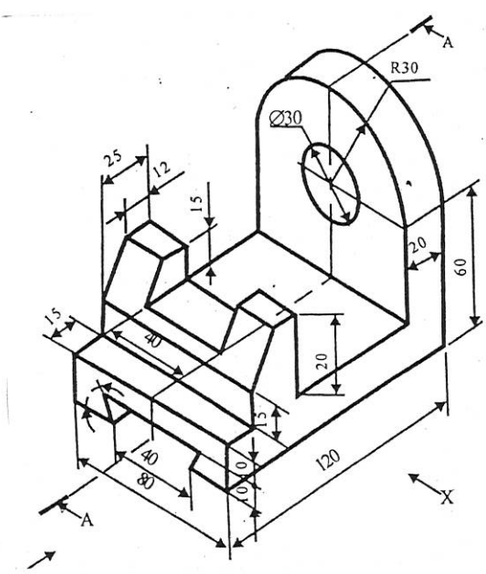
Q.No.4.b) Fig.No.2



Q.No.4.c) Fig.No.3

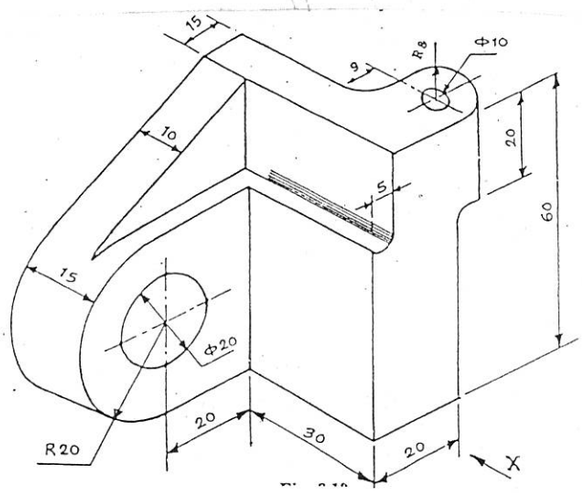


Q.No.5.a) Fig.No.4

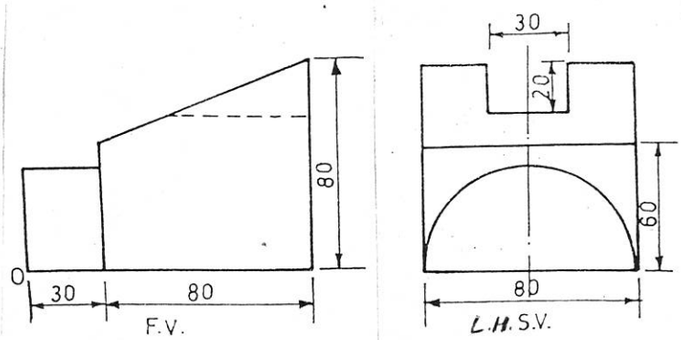


Q.No.5.b) Fig.No.5

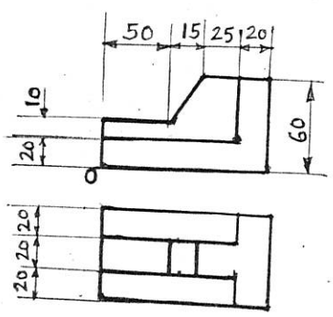
P.T.O 03/04



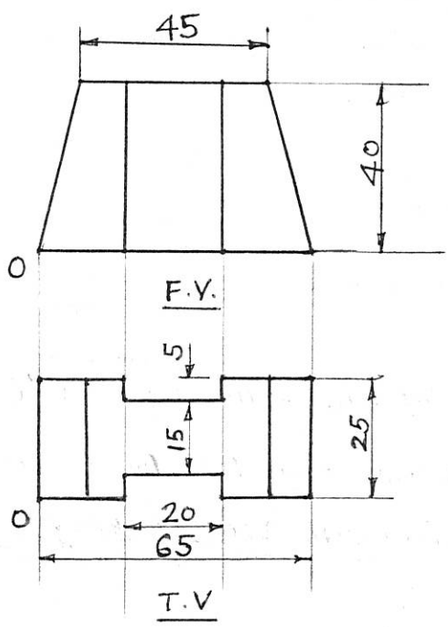
Que. No. 5. C). Fig. No. 6



Q. No. 6. a) Fig. No. 7



Q. No. 6. b) Fig. No. 8



Que. No. 6. C). Figure. No. 9

GOVERNMENT POLYTECHNIC, KOLHAPUR 416004.

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EVEN TERM END EXAM APRIL/MAY -2017

EXAM SEAT NO. | | | | | | |

LEVEL: **THIRD** PROGRAM: **COMMON**

COURSE CODE:

CEE301/MEE301/SME301/MTE301/CE201/ME201/SM201/MT201/C201/M201/1201/2201

COURSE NAME: **APPLIED MATHEMATICS**

MAX. MARKS: **80** TIME: **3 HRS.** DATE: **08/05/2017**

Instruction:-

1) Answers must be written in the main answer book provided. (and supplements if required)
2) Figure to the right indicates marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Q.1 Attempt any **FOUR** **Marks (08)**

a) Evaluate $\int \left[e^{2\log x} + e^{x\log a}\right] dx$

b) Find $\int \frac{\sin\sqrt{x}}{\sqrt{x}} dx$

c) Evaluate $\int \frac{dx}{3+2x-x^2}$

d) Evaluate $\int_1^2 \frac{dx}{3x-2}$

e) Evaluate $\int_1^e \log x dx$

f) Find mean value of y=cosx over the range from $x = \frac{-\pi}{2}$ *to* $x = \frac{\pi}{2}$

Q.2 Attempt any **FOUR** **(16)**

a) Evaluate $\int \frac{dx}{(x^2+4)(x+1)}$

b) Evaluate $\int \frac{dx}{3\sin 2x + 2\cos 2x}$

c) Evaluate $\int \frac{x+2}{\sqrt{x^2+5x+6}} dx$

d) Evaluate $\int_0^{\pi/4} \log(1+\tan x) dx$

e) Evaluate $\int_1^3 \frac{\sqrt[3]{x+5}}{\sqrt[3]{x+5}+\sqrt[3]{9-x}} dx$

f) Using integration find the area of the circle $x^2 + y^2 = 16$

Q.3 Attempt any **FOUR** **(16)**

a) Evaluate $\int_{\pi/6}^{\pi/3} \frac{1}{1+\sqrt[7]{\cot x}} dx$

b) Evaluate $\int \frac{3\sin x + 4\cos x}{2\sin x - \cos x} dx$

c) Evaluate $\int \cos\sqrt[3]{x}\, dx$

d) Evaluate $\int \frac{dx}{4\cos^2 x + 9\sin^2 x}$

e) Find R.M.S value of the I=10sin100πt over a complete period.

f) Find the area enclosed by the parabola $y = x^2 - 5x + 15$ and the line $y - 3x = 3$.

P.T.O

Q.4 Attempt any **FOUR** **(08)**

a) Form the differential equation by eliminating arbitrary constants if $y = A\cos 3x + B\sin 3x$

b) Solve $\sqrt{1-y^2}\,dx = \sqrt{1-x^2}\,dy$

c) state order and degree of the differential equation $\sqrt{1+\frac{dy}{dx}} = \frac{d^2y}{dx^2}$

d) Find range of the following data: 49, 13, 11, 12, 42, 29, 18, 27.

e) Find the probability of getting a sum of 3 when 2 unbiased dice is thrown.

f) The velocity of a body is given by $v = t(3+5t)$. How much distance does it travel in 4sec if it was initially at rest?

Q.5 Attempt any **FOUR** **(16)**

a) Solve: $\cos^2 x\frac{dy}{dx} + y = \tan x$

b) Solve: $v\frac{dv}{dx} = g - kv^2$ Where g and k are constants.

c) Solve: $(x+y+1)^2\frac{dy}{dx} = 1$

d) Calculate mean deviation about mean of the following data

Marks	3	4	5	6	7	8
No. of student	1	3	7	5	2	2

e) Calculate variance

C.I	0-10	10-20	20-30	30-40	40-50	50-60
fi	14	23	27	21	15	19

f) A husband and wife appeared for an interview for two vacancies in an office. The probability of husbands' selection is $\frac{2}{7}$ and that of wife selection is $\frac{1}{4}$. Find the probability that

i) Both of them are selected.

ii) Only one of them is selected.

Q.6 Attempt any **FOUR** **(16)**

a) If A and B are two events such that P(A)=0.8, P(B)=0.6, P(A∩ B)=0.5, find i) P(AUB) ii) $p(\frac{A}{B})$ iii) $p(\frac{B}{A})$

b) Solve: $(2xy + y - \tan y)dx + (x^2 - x\tan^2 y + \sec^2 y)dy = 0$

c) Solve: $y\,dx = xdy + \sqrt{xy}\,dx$

d) Find the equation of curve whose slope at any point is equal to $\frac{2y+x+1}{x}$ and which passes through the point (1, 0).

e) The mean weight of 150 students is 60kg. The mean weight of boys is 70kg with a S.D of 10kg. For the girls, the mean weight is 55kg. and the S.D is 15kg. Find the number of boys and the combined S.D.

f) The following table shows the marks obtained by 100 students in an examination. Calculate mean and variance.

Marks	1-10	11-20	21-30	31-40	41-50	51-60
No.of candidates	3	16	26	31	16	08

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GOVERNMENT POLYTECHNIC, KOLHAPUR 416004.

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EVEN TERM END EXAM APRIL/MAY -2017

EXAM SEAT NO. | | | | | | |

LEVEL: **THIRD** PROGRAM: **INFORMATION TECHNOLOGY**

COURSE CODE: **ITE312/IF228/R228** COURSE NAME: **HIGHER MATHEMATICS**

MAX. MARKS: **80** TIME: **3 HRS.** DATE: **05/05/2017**

Instruction:-

1) Answers must be written in the main answer book provided. (and supplements if required)
2) Figure to the right indicates marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Marks

Q.1 Attempt any **FOUR** **(08)**

a) With usual notations prove that $(1+\Delta)(1-\nabla)=1$

b) Express the following in factorial notation $f(x)=3x^2-2x+1$

c) Form forward difference table for

x	0	2	4	6	8
y	5	9	61	209	501

d) If $u=x^2(y-z)+y^2(z-x)+z^2(x-y)$, *prove that* $\frac{\partial u}{\partial x}+\frac{\partial u}{\partial y}+\frac{\partial u}{\partial z}=0$

e) If $u=e^{ax}\sin by$, *prove that* $\frac{\partial^2 u}{\partial x\partial y}=\frac{\partial^2 u}{\partial y\partial x}$

f) If $x=r\cos\theta,\ y=r\sin\theta$ *prove that* $\frac{\partial x}{\partial r}=\frac{\partial r}{\partial x}$

Q.2 Attempt any **FOUR** **(16)**

a) Find the missing term from the following table

x	100	101	102	103	104
y	2	2.0043	-----	2.0128	2.0170

b) Using Newton's forward interpolation formula, find the cubic polynomial and hence evaluate f (0.5) by the following data.

x	0	1	2	3	4
f(x)	-1	0	13	50	123

c) Compute $\sin 38^0$ upto 5 decimals, if

x^0	0	10	20	30	40
$\text{Sin}x^0$	0	0.17365	0.34202	0.5	0.64279

d) Using Lagrange's interpolation formula, find y when x=5 from the following data

x	0	1	3	8
y	1	3	13	123

e) Using Euler's theorem prove that $x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y}=1$ *if* $u=\log\left(\frac{x^3+y^3}{x^2+y^2}\right)$

f) If $u=x^2y+y^2z+z^2x$, *prove that* $\left(\frac{\partial}{\partial x}+\frac{\partial}{\partial y}+\frac{\partial}{\partial z}\right)^2 u=6(x+y+z)$

P.T.O

Q.3 Attempt any **FOUR** **(16)**

a) Verify Euler's theorem for $u = \log\left(\frac{x+y}{x-y}\right)$

b) If $u = 3x + 2y - z,\ v = x - 2y + z,\ w = x(x + 2y - z)$, *find* $\frac{\partial(u,v,w)}{\partial(x,y,z)}$

c) If $u_1 = \frac{x_2 x_3}{x_1},\ u_2 = \frac{x_3 x_1}{x_2},\ u_3 = \frac{x_1 x_2}{x_3}$ find value of $\frac{\partial(u_1,u_2,u_3)}{\partial(x_1,x_2,x_3)}$

d) If $u = \log\left[\frac{\sqrt{x^2+y^2}}{x+y}\right]$, *find the value of* $x^2\frac{\partial^2 u}{\partial x^2} + 2xy\frac{\partial^2 u}{\partial x \partial y} + y^2\frac{\partial^2 u}{\partial y^2}$

e) If $f(x) = 3x^4 - 2x^3 + 3x^2 + 2x - 1$ express f(x) in factorial notation and hence find $\Delta^3 f(x)$ *at* $x = 1$

f) Evaluate $\Delta^2\left[\frac{1}{x^2+5x+6}\right]$

Q.4 Attempt any **FOUR** **(08)**

a) An unbiased coin is tossed 6 times. Find the probability of getting 2 heads.

b) If the random variable has a Poisson's distribution such that P (1) = P (2), find P (3).

c) The probability of getting an item defective is 0.005 what is the probability that exactly 3 items in a sample of 200 are defective?

d) Find G.S of $y'' - 3y' + 2y = 0$

e) Find G.S of $y'' - y' - 12y = 0$

f) Solve : $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 4y = 0$

Q.5 Attempt any **FOUR** **(16)**

a) Fit Poisson's distribution for the following observation

x	0	1	2	3	4
f	20	12	10	6	2

b) Represent the solution set of the inequality. $2x_1 + 3x_2 \geq 12$ Graphically.

c) Solve the following LPP graphically: maximise $z = 5x + 10y$
Subject to : $x + 2y \leq 10,\ 3x + y \leq 12,\ x \geq 0, y \geq 0$

d) Solve : $(D^2 - 7D + 12)y = e^{2x}$

e) Solve $(D^2 - D + 1)y = \cos 2x$

f) Solve : $\frac{d^3y}{dt^3} + \frac{dy}{dt} = \cos t + t^2 + 3$

Q.6 Attempt any **FOUR** **(16)**

a) If 20% of bolts manufactured by a machine are defective. Determine the probability that out of 4 bolts deawn: i) one is defective ii) at the most 2 are defective.

b) Sacks of sugar packed by an automatic loader have an average weight of 100kg with S.D 0.25kg. Assuming normal distribution , find chance of sack yet weighing less than 99.5kg (SNV area of Z=2 is 0.4772)

c) Solve the following LPP graphically: minimize z=3x+y
Subject to $2x + 3y \leq 6,\ x + y \geq 1,\ x \geq 0, y \geq 0$

d) Food X contains 4 units of vitamin A per gram & 7 units of vitamin B per gram & cost 15 paise per gram food Y contain 6 units of vitamin A per gram & 11 units of vitamin B per gram & cost 22 paise per gram. The daily minimum requirement of vitamin A & vitamin B are 90 units & 130 units respectively. Formulate this as a L.P.P to minimise the cost

e) Solve $(D^3 + D^2 + D + 1)y = \sin 2x$

f) Solve $(D^3 - 1)y = (e^x + 1)^2$

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GOVERNMENT POLYTECHNIC, KOLHAPUR 416004.

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EVEN TERM END EXAM APRIL/MAY -2017

EXAM SEAT NO. | | | | | | |

LEVEL: **FIRST** PROGRAM: **COMMON**

COURSE CODE: **CCF106/CCE106/X110/R108/0108**

COURSE NAME: **ENGINEERING MATHEMATICS**

MAX. MARKS: **80** TIME: **3 HRS.** DATE: **06/05/2017**

Instruction:-

1) Answers must be written in the main answer book provided. (and supplements if required)
2) Figure to the right indicates marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

Q.1 Attempt any **FOUR** **Marks (08)**

a) Find the centroid of a triangle whose vertices are (1, 4) (2, 3) (0, -1)

b) Find the distance between the parallel lines $3x+2y-8=0$ and $3x+2y-4=0$

c) Find the acute angle between the lines $3x-2y+4=0$ *and* $2x-3y-7=0$

d) Find the equation of a circle whose center is at origin and radius 5

e) Find the equation of a circle whose diameter is the line segment joining the points (9, 0) & (0, 6)

f) Starting with the approximations $x_0=y_0=z_0=0$, for solving a set of equations by Gauss-Seidel method. If the next approximation gives $x_1=0.85,\ y_1=1.0275$. Find z_1. Given that $z=\frac{1}{10}[25-2x+3y]$

Q.2 Attempt any **FOUR** **(16)**

a) Show that the points (-2, 1), (-1, 3) and (1, 7) are collinear.

b) Determine which of the two circles is greater: $x^2+y^2-3x+4y=0$ and $x^2+y^2-6x+8y=0$

c) Find the equation of a circle passing through the point (2, 5) and (-5, 4) and whose center lying on the line $2x-3y+5=0$

d) Find the equation of a line passing through the points of intersection of the lines $2x+3y=13,\ 5x-y=7$ and passing through (1, -1)

e) Find the equation of perpendicular bisector of the join of A(-2, 3) and B(8, -1)

f) Use Jacobi's method to solve the equations $5x+2y+z=12,\ x+4y+2z=15,\ x+2y+5z=20$ (Third iterations only)

Q.3 Attempt any **FOUR** **(16)**

a) Using Gauss Seidel method solve $10x=2y+2z+6,\ 10y=x+2z+7,\ 10z=x+y+8$ (upto Third iterations)

b) Using Jacobi's method solve $5x-y-2z=-3,\ 3x+5y-z=10,\ -2x-y+4z=8$ (three iterations only)

c) Use Regula-Falsi method to solve $x^3-3x+5=0$ (upto second approximation)

d) Find $\sqrt[3]{29}$ by Regula-Falsi method upto second iteration

e) Find the square root of 12 by the method of bisection (upto 4 approximations)

f) Solve $x^3-6x+2=0$ by Bisection method (upto four iterations)

P.T.O

Q.4 Attempt any **FOUR** **(08)**

a) Test whether the function is even or odd if $f(x) = x^3 + 5\sin x$

b) Evaluate $\lim_{x \to 3} \dfrac{x^3 - 27}{x - 3}$

c) Evaluate $\lim_{x \to 0} \dfrac{\sin 5x}{3x}$

d) Find $\dfrac{dy}{dx}$ *if* $y = \cos^2 x$

e) Find $\dfrac{dy}{dx}$ *if* $y = \log\left(x^2 + 2x + 5\right)$

f) Find the slop of tangent to the curve $y = x^3$ *at* $x = 4$

Q.5 Attempt any **FOUR** **(16)**

a) If $y = f(x) = \dfrac{x+1}{x-1}$, $x \neq 1$ then show that $x = f(y)$

b) Evaluate $\lim_{x \to \frac{\pi}{4}} \dfrac{\sin x - \cos x}{x - \pi/4}$

c) If $y = x^y$ *prove that* $\dfrac{dy}{dx} = \dfrac{y^2}{x(1 - y\log x)}$

d) Find the derivative of $x.\sin^{-1} x$

e) Find $\dfrac{dy}{dx}$ *if* $y = \log\left[x + \sqrt{x^2 + a^2}\right]$

f) Discuss the stationary (Maximum & Minimum values) of $x^3 - 6x^2 + 9x - 2$

Q.6 Attempt any **FOUR** **(16)**

a) If $f(x) = 16^x + \log_2^x$ then find $f(1/4)$ $f\left(1/2\right)$

b) Evaluate $\lim_{x \to 4} \dfrac{x^4 - 64x}{\sqrt{x^2 + 9} - 5}$

c) Differentiate w. r. t x; $\tan^{-1}\left(\dfrac{x}{\sqrt{1 - x^2}}\right)$

d) Find $\dfrac{dy}{dx}$ *if* $13x^2 + 2x^2y + y^3 = 1$

e) If $y = (\sin x)^{\log x}$ *find* $\dfrac{dy}{dx}$

f) If $x = a(\theta + \sin\theta)$, $y = a(1 - \cos\theta)$ *find* $\dfrac{dy}{dx}$

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