

**FACULTY OF ENGINEERING****B.E. V – Semester (CBCS) (Civil)(Main) Examination November/ December 2018****Subject: Transportation Engineering – I****Time: 3 Hours****Max. Marks: 70****Note: Answer all questions from Part A and any five questions from Part B.****Part – A (20 Marks)**

1. Define Camber and list out different types of camber?
2. Explain PIEV Theory?
3. Define the term Model Speed?
4. Calculate the Time Mean Speed and Space Mean Speed for a given data

Speed in kmph	20-30	30-40	40-50	50-60
No. of Vehicles	3	5	2	2

5. What is the difference between Cutback and Emulsion?
6. What are the uses of Bitumen Penetration Test?
7. Explain ESWL?
8. What are the Uses of Dowel bars?
9. Define the term Tack Coat?
10. Define Bleeding in flexible pavement?

**Part – B (50 Marks)**

11. a) Explain in detail WBM and its Types? 5M  
b) What do you understand by pavement Evaluation and Maintenance? 5M
12. a) Explain CBR Test in detail? 5M  
b) Discuss in detail about construction joints, expansion joints and contraction joints. 5M
13. a) Explain Rotary Intersection with neat sketch. 5M  
b) Clearly explain about the bituminous mix design by Marshal Stability Test. 5M
14. a) Explain the factors to be consider for pavement design? 5 M  
b) Write a short note on types of paving binder? 5M
15. a) Explain the Engineering survey of highway Alignment? 7M  
b) A Gradient on NH 1/15, having radius of the curve is 150m. Calculate the grade compensation required? 3M
16. a) Explain types of transition curve? 4M  
b) The speed of overtaking and overtaken vehicles are 70 kmph and 40 kmph respectively on a two-way traffic road, the average acceleration during overtaking is  $0.99 \text{ m/sec}^2$ . Calculate overtaking sight distance, minimum and desirable length of overtaking Zone, draw a neat sketch of the overtaking zone and show the sign posts. 6M
17. a) The following data obtained from the spot speed studies. Calculate the speed limit for regulation and speed to check design elements. 7M

Mid speed kmph	15	25	35	45	55	65	75	85	95
Number of Vehicles	0	6	16	34	28	17	6	3	2

- b) Explain Contact Pressure? 3M

\*\*\*\*\*

**FACULTY OF ENGINEERING****BE (EEE) V – Semester (CBCS) (Main) Examination November / December 2018****Subject: Electrical Machines-II****Time: 3 Hours****Max.Marks: 70****Note: Answer All Questions From Part-A, & Any Five Questions From Part-B.****PART – A (10x2 = 20 Marks)**

- 1 What is the difference between an ideal and practical transformer?
- 2 What are the applications of auto transformers?
- 3 What are the conditions must be fulfilled for the successful operation of 3 phase transformers?
- 4 What are the advantages of - transformation?
- 5 What is rotating magnetic field theory?
- 6 Draw slip-torque characteristics of 3 phase induction motor showing braking, motoring and generation modes.
- 7 Mention various methods of speed control of 3phase induction motors.
- 8 Why are starters used for starting of induction motors (3-phase)?
- 9 How to change the direction of induction motor?
- 10 What are the various types of single phase induction motor?

**PART – B (5x10 = 50 Marks)**

- 11 Discuss in brief about the construction and basic principle of transformer. [10]
- 12 A single-phase transformer working at unity power factor has an efficiency of 90% on both half load and at full load of 500Kw. Determine:
  - i) Iron loss
  - ii) Full load copper loss
  - iii) Efficiency at 75% of full load
  - iv) Maximum efficiency. [10]
- 13 Explain Scott connection for 3-phase to 2-phase conversion and show that the primary neutral divides the teaser primary winding in the ratio 2:1. [10]
- 14 The power input to the rotor of a 440V, 50Hz, 3-phase,6-pole induction motor is 50 kW. The rotor emf makes 120 cycles per minute. Friction and windage losses are 2 kW. Calculate:
  - i) Slip
  - ii) Rotor speed
  - iii) Rotor copper losses
  - iv) Mechanical power developed
  - v) Output power (vi) output torque. [10]
- 15 a) Derive the expression for torque, maximum torque and starting torque of 3-phase induction motor. [5]
  - b) A 60Hz induction motor has 2 pole and runs at 3,510 rpm. Calculate:
    - i) The synchronous speed and
    - ii) The per cent slip. [5]
- 16 Describe briefly various speed control techniques for induction motors (both squirrel cage and wound rotor types). [10]
- 17 Explain the construction and working principle of universal motor. [10]

**FACULTY OF ENGINEERING****B.E. V Semester (Inst.)(CBCS)(Main) Examination, November/December 2018****Sub: Instrumentation Systems****Time: 3 Hours****Max. Marks: 70****PART –A (20 Marks)****Answer all questions from Part – A**

1. Explain the principle of DC tachogenerator. [2]
2. Define turbulent flow. [2]
3. Discuss hair hygrometer. [2]
4. Define PWL. [2]
5. Draw concentric and eccentric orifice plates. [2]
6. What do you mean by RH? Explain it. [2]
7. Write the principle of stroboscope. [2]
8. Discuss Inverse square law. [2]
9. Explain law of additive emf. [2]
10. What do you mean by hydraulic load cell? [2]

**PART –B (50 Marks)****Answer any five questions from Part - B**

11. a) Explain Piezo electric accelerometer. [5]  
b) Explain with neat diagram AC Tachogenerator. [5]
12. Derive an equation of volumetric flow rate for Head type flow meter. [10]
13. a) Explain in detail Rota meter with neat diagram. [6]  
b) Write advantages and disadvantages of Head type flow meter. [4]
14. a) Explain in detail sound level meter with neat block diagram. [6]  
b) The following SPLs were measured for a machine operating in a noisy environment. SPL of machine in addition to background noise is 90 db. SPL of background noise is 80db.  
Determine the SPL of machine alone. [4]
15. a) Discuss the basic methods of force measuring devices. [6]  
b) Write a short note on Bonded Strain gauge accelerometer. [4]
16. a) Explain with neat diagram, measurement of liquid level using gamma rays. [5]  
b) Explain resistive hygrometer in detail. [5]
17. Write a short note on  
a) Hot wire anemometer. [5]  
b) Measurement of temperature by radiation method. [5]

\*\*\*\*\*

**FACULTY OF ENGINEERING****B.E. V Semester (CBCS) (ECE) (Main) Examination, Nov/Dec 2018****Subject: Computer Organization and Architecture****Time: 3 Hours****Max. Marks: 70****Note: Answer all questions from Part- A & Answer any Five questions from Part-B****PART – A (20 Marks)**

- 1 Represent the number (+46.5) as a floating point binary number with 24 bits. The normalized fraction mantissa has 16 bits and the exponent has 8 bits. [2]
- 2 Differentiate between restoring and non-restoring division algorithm. [2]
- 3 Write the Basic Computer instruction formats for the memory, register and I/O reference instructions. [2]
- 4 What is microinstruction? Compare vertical and horizontal microinstruction formats. [2]
- 5 Differentiate between software interrupt and a subroutine call. [2]
- 6 Determine the number of clock cycles to process 200 tasks in a six-segment pipeline [2]
- 7 Distinguish between RISC and CISC processors. [2]
- 8 Explain the need for an I/O interface. [2]
- 9 What is meant by 'Locality of reference' property and how does it help in faster execution of the programs. [2]
- 10 How many  $128 \times 8$  RAM chips are needed to provide a memory capacity of  $2048 \times 16$  words? [2]

**Part – B (50 Marks)**

11. a) Explain the process of floating point number multiplication with a flow chart. [5]  
b) Show the hardware for a 2 bit-by-2 bit array multiplier and explain. [5]
12. a) Explain the common bus system of a basic computer with a neat sketch. [6]  
b) Explain the operation of an address sequencer in a micro programmed control unit. [4]
13. a) Explain instruction formats for various types of computer organizations as single accumulator, general register and stack. [6]  
b) Show how a 9-bit micro operation field in a microinstruction can be divided into subfields to specify 46 micro operations. How many micro operations can be specified in one microinstruction? [4]
14. a) Explain instruction pipeline conflicts and their remedies. [5]  
b) Formulate a six-segment instruction pipeline for a computer. Specify the operations to be performed in each segment. [5]
15. a) Draw the block diagram of an asynchronous communication interface and Explain its operation. [5]  
b) Describe in detail how data is transferred using DMA. [5]
16. a) What are the cache design elements? Explain Set-associative cache mapping in cache memory. [6]  
b) What do you mean by memory hierarchy? Describe in detail. [4]
17. Write short note on any two of the following: [10]  
a) Vector processing.  
b) Virtual memory concept.  
c) Stored program organization.

\*\*\*\*\*

**FACULTY OF ENGINEERING****B.E. V Semester (CBCS) (M/P/AE) (Main) Examination, Nov./Dec. 2018****Subject: Operation Research****Time: 3 Hours****Max. Marks : 70****Note Answer all questions from Part – A, & any five questions from Part – B.****Part – A (20 Marks)**

1. What is the scope for operations research?
2. Define the terms
  - (i) Basic Solution and
  - (ii) Optimum solution
3. State features of duality in L.P.P
4. Write down the dual of the following problem.  
 Minimise  $z = 2x_1 + 2x_2$   
 Subject to constraints  
 $2x_1 + 4x_2 \geq 1$   
 $1x_1 + 2x_2 \geq 1$   
 $2x_1 + 1x_2 \geq 1$   
 $x_1, x_2 \geq 0$
5. Write the procedure of MODI (Modified Distribution) Method for obtaining optimal solution.
6. What is an unbalanced Assignment problem? Write steps to solve it.
7. State the features of Individual Replacement Policy and Group Replacement Policy.
8. State the maximum criterion of the optimality.
9. Define the terms (i) Optimal sequence and  
(ii) Total Elapsed Time.
10. Write about Kendall's Notation and mention the terms involved in it.

**PART – B (50 Marks)**

11. A company produces two types of leather belts, say type A and type B. Belt A is superior quality and Belt B is of lower quality. Profits aft on the two type of belts are 40 paise and 30 paise belt respectively. Each of the belts of type A requires twice or much of type B, The company can produce 1000 belts per day. Belt A requires fancy buckles and only 400 fancy buckles are available for this per day. For belt of type B, only 700 buckles are available per day. How should the company manufacture the two types of belts in order to have a maximum overall profit? Use the graphical method.
12. Use the dual simple method to solve the following problem.  
 Minimize  $z = 6x_1 + 3x_2 + 4x_3$   
 Subject to constraints  
 $x_1 + 6x_2 + x_3 = 10$   
 $2x_1 + 3x_2 + x_3 = 15$   
 $x_1, x_2, x_3 \geq 0$

13. Solve the following Transportation problem to maximize the total profit. Here entries are profits.

		Destination				Capacity
		A	B	C	D	
Origin	$O_1$	40	25	22	33	100
	$O_2$	44	35	30	30	30
	$O_3$	38	38	28	30	70
Capacity		40	20	60	30	

14. Find an optimal solution to an assignment problem with the following cost matrix.

	I	II	III	IV
A	5	3	1	8
B	7	9	2	6
C	6	4	5	7
D	5	7	7	6

15. The mortality rate shown in table below was observed for a certain type of light bulb.

Week(t)	1	2	3	4	5
Percent failing at the end of week	10	25	50	80	100

There are 1000 bulbs in use and it costs Rs.10 to replace an individual bulb, which has burnt out. If all bulbs were replaced simultaneously, it would cost Rs. 4 per bulb. It is proposed to replace all the bulbs at fixed intervals, whether or not they have burnt out and continue to replace the bulbs as and when they fail. At what intervals, all the bulbs should be replaced. At what group replacement price per bulb would a policy of strictly group replacement become preferable to the individual replacement policy?

16. A shoe manufacturer has to process six items through three stages of production, i.e., cutting, posting and curing. The time taken for each of these items at the different stages is given below in the following table.

Item	A	B	C	D	E	F
Cutting	4	1.5	3.5	1	2.5	0.5
Posting	1.5	2	2.5	1	0.5	3
Curing	4	3.5	3	4.5	5	4.5

17. A repair shop attended by a single mechanic has an average of 4 customers per hour, who brings small appliances for repair. The mechanic inspects them for defects and quite often can fix them right away or otherwise renders diagnosis. This takes him 6 minutes on an average. Arrivals are poisson and service time has the exponential distribution. Find

- The proportion of time during which the shop is empty.
- The probability of finding at least one customer in the shop.
- The average number of customers in the system.
- The average time including the service time spent by the customer.

\*\*\*\*\*

**FACULTY OF ENGINEERING****BE V Semester (CBCS)(CSE) (Main) Examination, November / December 2018****Subject: Computer Graphics****Time: 3 Hours****Max. Marks: 70****Note: Answer all questions from Part-A and any five questions from Part-B****PART-A (20 MARKS)**

1. What is the idea behind "Clipping" in graphics?
2. Draw the architecture of geometric pipeline.
3. Find a homogeneous-coordinate representation of a plane.
4. Derive the transformation matrix for reflection of a point along with the line inclined at angle of  $-45$  degrees with positive directions of X-axis.
5. What is the advantage "Antialiasing" in computer graphics.
6. As a part of graphics design application, you are supposed to eliminate the hidden surfaces in your design. You have a option of choosing either the Z-Buffer technique or the Painters algorithm. Which algorithm will you choose for depth calculation at each pixel on a scan line can be incrementally if the plane equation for each polygon is available?
7. Workout the visibility of the line X (-12,32) –Y(36,10) in the clipping window A(0,0), B(30,0), C(30,20), D(0,20), making use of the out codes of the end points of the line.
8. Show how Quad trees can be used to draw an image at different resolutions.
9. What is the main difference between Gouraud shading with Phong shading methods? Which of the two is better?
10. Briefly describe following OpenGL functions and their application:  
(i) GlutInit () (ii)GL-LINE\_STRIP() (iii) glInitDisplayMode() (iv) glOrtho().

**Part – B (50 Marks)**

11. (a) Distinguish between line-drawing displays and raster displays.  
(b) Write a Program to draw a 2D triangle in open GL.
12. (a) Explain the different types of logical input graphics primitives.  
(b) Write the frames in OpenGL. Explain in detail.
13. (a) Use the Cohen Sutherland algorithm to clip line P1(70,20) and P2(100,10) against a window lower left hand corner(50,10) and upper right hand corner(80,40).  
(b) Write the 2D transformation matrices for three basic transformations: translation, rotation and scaling.
14. (a) Explain about Phong Lighting model.  
(b) Briefly explain about Hidden surface removal.
15. Explain the steps involved in window to view port transformation.
16. (a) Draw a smooth sketch of the cubic Bezier curve given the four control points A(30,0), B(0,0), C(50,-10), D(50,-40).  
(b) Write any three properties of Bezier curve. What are the limitations of Bezier curves?
17. Write short notes on  
(a) Perspective projection  
(b) Cubic B-splines

\*\*\*\*\*

**FACULTY OF ENGINEERING**

**BE V Semester (CBCS) (IT) (Main) Examination, November / December 2018**

**Subject: Computer Networks**

**Time: 3 Hours**

**Max. Marks: 70**

**Note: Answer all questions from Part-A and any five questions from Part-B**

**PART-A (20 MARKS)**

- 1 What is a Computer Network? Give Example
- 2 List the layers of ISO-OSI reference model.
- 3 Differentiate between TCP and UDP.
- 4 List the applications of UDP.
- 5 What is Digital Signature?
- 6 Differentiate between static and dynamic Web documents.
- 7 Differentiate Substitution Ciphers and Transposition Ciphers.
- 8 What is a daemon Process?
- 9 Differentiate between unicasting, multicasting and broadcasting.
- 10 What are the services of Transport Layer?

**Part – B (50 Marks)**

- 11 What are the functions of Network Layer? List out the design issues in it? (10)
- 12 Draw the IPV6 Header format and explain various fields in it. (10)
- 13 Describe about connection-oriented communication with block diagram using elementary socket system calls. (10)
- 14 Explain the architecture of WWW, with specific roles of each components. (10)
- 15 a) Explain in detail about any Symmetric Key algorithm like DES (5)  
b) Explain in detail about approaches for web security. (5)
- 16 Write short notes on RPC. Explain the steps in making RPC. (10)
- 17 What is congestion? Discuss about causes for congestion. Explain any three congestion control Algorithms. (10)

\*\*\*\*\*



**FACULTY OF ENGINEERING****B.E. 3/4 (Civil) I-Semester (Backlog) Examination, November / December 2018****Subject : Transportation Engineering****Time : 3 hours****Max. Marks : 75****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (25 Marks)**

- 1 List the basic requirements of an ideal alignment between two terminal stations. 2
- 2 What is off-tracking? 3
- 3 Calculate the density of traffic if the traffic volume is 5400 PCU's/hr and speed is 60 kmph. 2
- 4 Write the importance of 15<sup>th</sup>, 85<sup>th</sup> and 98<sup>th</sup> percentile speeds in traffic engineering. 3
- 5 Differentiate between flexible and rigid pavements. 3
- 6 What is meant by cut-back bitumen? 2
- 7 Discuss the necessity and effects of coning of wheels with a neat sketch. 3
- 8 Find the number of sleepers required for the construction of a B.G. track 900 m long using sleeper density of  $n+5$ . 2
- 9 Define i) cross wind components ii) wind coverage iii) calm period 3
- 10 Determine the airport reference temperature for the following data : 2  
Mean of maximum daily temperatures =  $46^{\circ}\text{C}$   
Mean of average daily temperatures =  $37^{\circ}\text{C}$

**PART – B (50 Marks)**

- 11 a) Explain various factors to be considered for highway alignment. 4  
b) A horizontal circular curve of radius 300m is to be aligned on a highway, 7m wide, in a built-up area. The design speed is 65 kmph and the wheel base of the design vehicle = 6m. Determine i) super-elevation ii) extra width of pavement needed iii) length of transition curve required. 6
- 12 a) What are the objects of traffic volume studies? Explain how the traffic volume data is presented and the results interpreted for use in traffic engineering design. 5  
b) What is a rotary intersection? Explain the IRC method of design of rotary through a neat sketch. 5
- 13 a) Explain the different types of joints in cement concrete pavements. 4  
b) Using the data given below, calculate the wheel load stresses at i) interior ii) edge iii) corner regions of a cement concrete pavement using Westergaard's stress equations. Also determine the probable location where the crack is likely to develop due to corner loading. Wheel load,  $P = 5100 \text{ kg}$ , Modulus of elasticity of cement concrete,  $E = 3 \times 10^5 \text{ kg/cm}^2$ , pavement thickness,  $h = 18\text{cm}$ , Poisson's ratio of concrete = 0.15, Modulus of sub-grade reaction,  $K = 6 \text{ kg/cm}^3$ , radius of contact area,  $a = 15\text{cm}$ . 6

..2

- 14 a) Draw a typical cross-section of a permanent way on embankment. Describe the requirements of an ideal permanent way. 5
- b) What should be the equilibrium cant on a M.G curve of five degrees for an average speed of 60 kmph? Also find out the maximum permissible speed after allowing the maximum cant deficiency. 5
- 15 a) Write the various factors required to be considered for site selection of a new airport. 5
- b) The basic length of a runway required for take-off and landing are 2000m and 2400m respectively at the proposed site for an airport situated 450m above MSL. The airport reference temperature is 24°C and the effective gradient along the proposed runway is 0.4%. Calculate the actual length of the runway to be provided. 5
- 16 a) Explain highway capacity and level of service concept as per HCM 2000. 5
- b) Draw the layout of a left hand turn-out. Discuss the functions of its components in detail. 5
- 17 Write short notes on any **Four** of the following : 10
- a) Road patterns
  - b) Spot speed study
  - c) Dowel bars and Tie bars
  - d) Creep in rails
  - e) Aircraft characteristics

\*\*\*\*\*

**FACULTY OF ENGINEERING****B.E. 3/4 (EE/EIE) I – Semester (Backlog) Examination, November / December 2018****Subject: LINEAR INTEGRATED CIRCUITS****Time : 3 hours****Max. Marks : 75****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (25 Marks)**

- 1 Mention the advantages of active load over passive load in operational amplifier? (3)
- 2 Define input offset current operational amplifier? (2)
- 3 Draw the characteristics of ideal amplifier? (3)
- 4 Mention the applications of analog multiplier? (2)
- 5 Define lock range of phase locked loop? (3)
- 6 Determine the number of comparators and resistor required for 8bit flash type ADC? (3)
- 7 Mention the advantages of R – 2R ladder type analog to digital converter? (3)
- 8 What is the purpose connecting capacitor at the input and output side of voltage Regulator? (2)
- 9 Mention the advantages of active filter over passive filter? (2)
- 10 Draw the characteristics of ideal amplifier? (2)

**PART – B (10 X 5 = 50 Marks)**

- 11 a) Explain the working of an practical voltage regulator and explain its frequency Response graph ? (5)
- b) Design a integrator to integrate an input signal varies in frequency from 10Hz to 10Khz ? (5)
- 12 a) Explain the operation of inverting Schmitt trigger circuit? (5)
- b) Explain the operation of zero crossing detector and draw the input and output waveforms? (5)
- 13 Derive the expressions for the lock in and capture ranges of IC 566PLL? (10)
- 14 a) Explain the operation of current to voltage converter and derive the necessary equations? (5)
- b) Explain the working of A/D converter? (5)
- 15 a) With a neat block diagram explain the working of 2bit flash type ADC? (5)
- b) Explain the principle and operation of Hybrid Voltage Regulator? (5)
- 16 a) Design second order Butter-worth HPF having an upper cut off frequency 2kHz. (5)
- b) Explain the operation of balanced demodulator? (5)
- 17 Write a short notes on
  - (a) Op-amp can as log amplifier (5)
  - (b) Instrumentation Amplifier (5)

## FACULTY OF ENGINEERING

BE 3/4 (ECE) I-Semester (Backlog) Examination, November / December 2018

SUBJECT : Automatic Control Systems

Time: 3 Hours

Max. Marks: 75

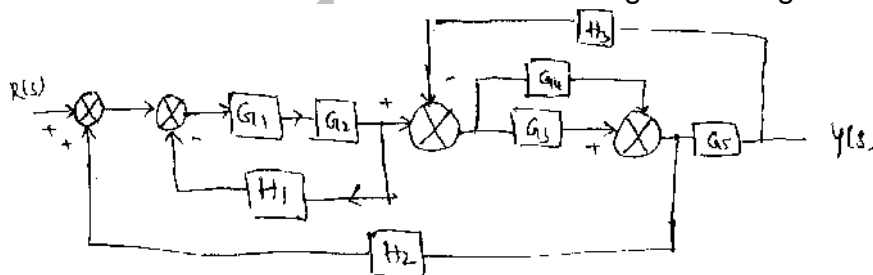
Note: Answer all questions from Part-A & any Five Questions from Part-B.

### PART-A (25 Marks)

- |  |   |
|--|---|
| 1. Differentiate open loop and closed loop system  | 2 |
| 2. Define Gain margin & phase margin   | 2 |
| 3. Given $r(t) = (1-t^2) u(t)$ . Find steady state error?  | 3 |
| 4. Given characteristic equation as $2s^3 + 3s^2 + 2s + K = 0$ . Find the condition for K for the system to be stable? | 3 |
| 5. Explain briefly PID Controller?   | 2 |
| 6. What are the merits of Bode plot over Nyquist plots?  | 3 |
| 7. Draw the Bode plot of a Log Network?  | 3 |
| 8. Write four advantages of Digital Control system?  | 2 |
| 9. Explain the properties of state transition matrix?  | 3 |
| 10. Define controllability and observability of a system?  | 6 |

### PART-B (50 Marks)

- |  |   |
|--|---|
| 11. a) Write Force Voltage analogy for the elements of mechanical translation system | 4 |
| b) Determine the overall transfer function for the following block diagram?          |   |



- |   |   |
|---|---|
| 12. a) Using Routh Criterion design the Stability of the system represented by the characteristic equation $s^4 + 8s^3 + 18s^2 + 16s + 5 = 0$ | 4 |
| b) Construct the Root Locus for the following Loop transfer function  | 6 |

$$G(s) \cdot H(s) = \frac{K}{s(s+4)(s^2+4s+20)}$$

- |   |    |
|---|----|
| 13. a) What is the principle of argument?   | 4  |
| b) What are the specification of 2 <sup>nd</sup> order system?  | 6  |
| 14. a) For the system with transfer function, draw the bode plot and obtain gain margin and phase margin $G(s) = \frac{400(s+2)}{s^2(s+5)(s+10)}$ | 10 |
| 15. Explain the architecture of Digital control system?   | 10 |

16. a) What are advantages of state space representation 3

b) A system is described by the following differential equations. Obtain state space 7

representation of the system  $\frac{d^3x}{d+3} + 3\frac{d^2x}{d+1} + 4\frac{dx}{dt} + 4x = u_1(t) + 3u_2(t) + 4u_3(t)$

$$y_1 = 4 \frac{dx}{dt} + 3u_1 \quad y_2 = \frac{d^2x}{dt^2} + 4u_2 + u_3$$

17. Write short notes on

- Masons gain formula
- Nyquist Criterion
- Compensators

10

\*\*\*\*\*

OU - 1607 OU - 1607

**FACULTY OF ENGINEERING****B. E. 3/4 (Mech.) I-Semester (Backlog) Examination, November / December 2018****Subject: Manufacturing Processes****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A, & Answer any FIVE Questions from Part-B.****PART-A (25 Marks)**

- 1 What properties are required for core sands [2]
- 2 List four different types of patterns along with their applications [2]
- 3 How high mould strength and hardness is obtained in Co<sub>2</sub> moulding. [2]
- 4 Give applications of MEMS [2]
- 5 Why gas welding is not used for welding thick sections [1]
- 6 Give the principle of arc welding. Why only minimum gap has to be maintained between electrode and work piece. [3]
- 7 What is distortion in welding and state the reasons for its occurrence [2]
- 8 State Von-mises yield criteria [2]
- 9 What is spring back effect in bending? With neat sketch [1]
- 10 How clearance is provided in blanking and piercing operations respectively [3]
- 11 With sketches show how wire drawing is different from extrusion [3]
- 12 Give classification of welding processes [2]

**PART-B (50 Marks)**

- 13 (a) What is the requirement of risers? How the location of riser is selected. Name different types of risers. [6]  
(b) State different types of pattern allowances. Why should they be provided? [4]
- 14 (a) Which casting procedure is used to produce intricate design castings? With neat sketches explain the process in detail. [5]  
(b) Name different methods of processing plastics. Explain any one method in detail. [5]
- 15 (a) Sketch and label gas welding nozzle and gas cutting nozzle. Give the principle of the cutting material with gas cutting nozzle. [6]  
(b) How the coated electrodes are specified and state the various uses of coating on electrode. [4]
- 16 (a) With sketches explain in detail the principle and operation of friction welding. How the flash is removed. Give its merits and applications? [6]  
(b) Sketch projection resistance welding set up; Give its principle and its applications. [4]
- 17 (a) Sketch and label lathe spinning set up. State its operating principle. Give its applications [5]  
(b) Sketch different types of roller mills and state the use of each roller mill [5]
- 18 (a) Name different types of gating system and state merits and limitations of each. [5]  
(b) How to identify different types of gas flames. Give application of each flame. [5]
- 19 Write short notes on
  - (i) Atomic hydrogen welding [5]
  - (ii) Rubber pad forming [5]

\*\*\*\*\*

**FACULTY OF ENGINEERING****B.E. 3/4 (Prod.) I-Semester (Backlog) Examination, November / December 2018****Subject : Metal Forming Technology****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A & any five questions from Part-B.****PART – A (25 Marks)**

- |    |   |   |
|----|---|---|
| 1  | What is the effect of temperature on the metal forming processes? Explain.      | 3 |
| 2  | Write the advantages and limitations of cold working process.                   | 2 |
| 3  | Sketch the operation of blanking with the help of a sketch.                     | 3 |
| 4  | How compound dies differ from the progressive dies? Explain.                    | 2 |
| 5  | How do you estimate the load required for extrusion operation? Explain briefly. | 2 |
| 6  | Describe the operation of spinning with the help of a neat sketch.              | 3 |
| 7  | Briefly explain the Swaging operation with the help of a sketch.                | 3 |
| 8  | List out the defects occurred during drawing operations.                        | 2 |
| 9  | What is the effect of <i>Roll Separating Force</i> on rollers? Explain briefly. | 3 |
| 10 | Sketch <i>four high rolling mills</i> and label the parts.                      | 2 |

**PART – B (50 Marks)**

- 11 (a) Discuss the Tresca's and von Mises yield criteria.  
(b) Explain the Crysto Plasticity and Thermo Plasticity.
- 12 (a) Explain the Sheet Metal operations: shearing, piercing and bending with neat sketches.  
(b) Explain the different types of presses that used in Sheet metal works.
- 13 (a) Describe various defects that occur during extrusion processes. Mention their causes and remedy.  
(b) Explain the principle of Stretch forming operations with the help of a sketch.
- 14 (a) Differentiate clearly between Spinning and Flow forming processes.  
(b) Explain the principle of Hot isostatic pressing. Mention its advantages and applications.
- 15 (a) What are the important features of a forging die? Explain their significance.  
(b) Describe the principle of a rolling process with a neat sketch.
- 16 (a) Give a detailed classification of rolling operations. Mention their advantages and applications.  
(b) Explain the principle of Roll bending with a neat sketch.
- 17 Write short notes on any TWO of the following:  
a) Plane stress and plane strain conditions  
b) Drop forging.  
c) I-Beam Rolling.

**FACULTY OF ENGINEERING****B.E. 3/4 (AE) I-Semester (Supply.) Examination, November / December 2018****Subject : Production Technology****Time: 3 Hours****Max. Marks: 75**

Note: Answer all questions from part-A and any FIVE questions from part-B

**PART-A (25 Marks)**

- 1 Name different types of patterns [2]
- 2 Enlist various moulding methods [3]
- 3 Sketch the different types of flames and label its temperatures [2]
- 4 Distinguish between Soldering and Brazing [3]
- 5 What is neutral plane in rolling? Explain with a sketch [2]
- 6 Distinguish between Tube drawing and Tube extrusion by diagram [3]
- 7 Sketch a Single point cutting tool and label its angles [3]
- 8 Enlist different types of chips [2]
- 9 Distinguish between Drilling and Boring [3]
- 10 Name three tool holding and work holding devices in lathe [2]

**PART-B (50 Marks)**

- 11 Explain Shell moulding process with neat sketch. State its advantages, limitations and applications. [10]
- 12 (a) Explain Ultrasonic welding with a neat sketch [5]  
(b) State the advantages, limitations and applications of Plasma Arc Welding [5]
- 13 (a) Distinguish between hot working and Cold working [5]  
(b) With a neat sketch explain drop forging operation [5]
- 14 (a) What are the essential properties of cutting fluids [5]  
(b) Sketch a Single Point Cutting Tool and label its angles and write the tool nomenclature [5]
- 15 (a) Distinguish between capstan lathe and turret lathe [5]  
(b) Sketch in detail a Twist drill and label its parts [5]
- 16 (a) Explain Investment casting with neat sketch. [5]  
(b) Enlist various welding defecting with neat sketches. Explain its causes and remedies to overcome the defects. [5]
- 17 (a) Distinguish between blow moulding and injection moulding [5]  
(b) Sketch Two high roll mill, Three high roll mill, and Cluster high roll mill [5]

\*\*\*\*\*



**FACULTY OF ENGINEERING****B.E. 3/4 (CSE) I - Semester (Backlog) Examination, November / December 2018****Subject : Data Communication****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A and answer any five questions from Part-B.****PART – A (25 Marks)**

- 1 Define Data Communication and Channel Capacity. (2)
- 2 Why is the layered concept is needed in Protocol Architecture? (3)
- 3 How does frame Relay differ from X.25? (3)
- 4 Illustrate the frame format of asynchronous transmission. (2)
- 5 With a schematic explain how statistical TDM Efficiently utilize Bandwidth. (3)
- 6 What is the need for AAL? (2)
- 7 What is the difference between Layer 2 and Layer 3 Switches? (3)
- 8 What is MAC Protocol? Where is it needed? (2)
- 9 What is the principle of frequency reuse technique? (3)
- 10 Explain IEEE 802.11 MAC Frame format. (2)

**PART – B (50 Marks)**

- 11 (a) Explain about TCP / IP layers. (6)  
(b) Differentiate BPSK and QPSK. (4)
- 12 (a) Explain in detail CRC error deletion technique. (5)  
(b) Write in detail the frame structure of HDLC. (5)
- 13 (a) Explain the concept of sliding window protocol. (5)  
(b) Describe the ATM cell header format. (5)
- 14 (a) Explain different transmission impairments. (5)  
(b) Illustrate the Event Timing for circuit switching and packet switching. (5)
- 15 (a) Explain the Ethernet frame format. (5)  
(b) Explain the difference between Fast Ethernet and Gigabit Ethernet. (5)
- 16 (a) Explain IEEE 802.11 Architecture and Services. (5)  
(b) Explain Bluetooth architecture. (5)
- 17 Write short notes on any **two** of the following:
  - (a) XDSL (5)
  - (b) CSMA/CD (5)
  - (c) Principles of Cellular Networks (5)

## FACULTY OF ENGINEERING

BE 3/4 (I.T.) I Semester (old) Examination, November/December 2018

Subject: Theory of Automata

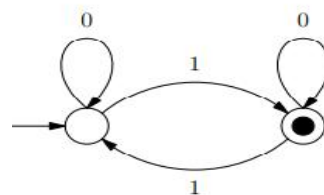
Time: 3 Hours

Max. Marks: 75

Note: Answer All Questions from Part- A and Any five Questions from Part – B

### Part – A (25 Marks)

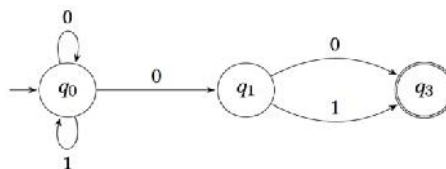
1. Design a DFA for strings containing even number of zeroes. (3M)
2. Define  $\epsilon$ -closure of a state. (2M)
3. Convert following DFA to RE using state elimination method (3M)



4. Draw NFA for the strings that begin with "a" and end with "b" over  $\Sigma = \{a, b\}$  (3M)
5. What is recursively enumerable language? (2M)
6. Define parse tree and draw the parse tree for string aabbab using the grammar. (3M)
  - S  $\rightarrow aB$
  - A  $\rightarrow aS \mid bAA \mid a$
  - B  $\rightarrow bS \mid aBB$
7. When does a Turing Machine Halt? (2M)
8. What are the applications of Context free languages? (2M)
9. Define Homomorphism. Give an example. (3M)
10. What is ambiguous grammar? (2M)

### PART B(50 Marks)

- 11.a) Convert the given NFA to DFA. (6M)



- b) Differentiate between NFA and DFA. (4M)
- 12.a) State and prove pumping lemma for context free languages. (5M)
  - b) Prove that the language  $L = \{a^n b^n c^n \mid n \geq 1\}$  is not a context free language. (5M)
- 13.a) Design a PDA for language  $L = \{wcwr, \text{ where } w \in (a+b)^*\}$ . (6M)
  - b) Give the instantaneous descriptions for string aabcbaa. (4M)

contd...2

-2-

14. Design Turing machine for language  $L = a^n b^n c^n$  where  $n \geq 1$ . Justify your design with a suitable example. (10M)
- 15.a) Explain about undecidable problems. (5M)  
b) Explain about NP-complete problem. (5M)
16. Convert the following grammar to Chomsky normal form. (10M)
- S  $\rightarrow$  0A0 | 1B1 | BB  
A  $\rightarrow$  C  
B  $\rightarrow$  S | A  
C  $\rightarrow$  S
17. Write short notes on :
- a) Multi-stack machine (5M)  
b) Applications of Finite Automata (5M)

\*\*\*\*\*

## FACULTY OF ENGINEERING

B.E. 3/4 (IT) I-Semester (Backlog) Examination, November / December 2018

Subject : Theory of Computation

Time : 3 hours

Max. Marks : 75

**Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (25 Marks)**

- 1 Write the difference between NFA and  $\epsilon$ -NFA. 2
- 2 Construct a DFA to accept the substring 'abb' for  $\Sigma = \{a, b\}$ . 3
- 3 Construct a parse tree for the string  $f + x xy$  using the grammar  
 $E \rightarrow +EE \mid -EE \mid *EEE \mid x \mid y$  2
- 4 State various closure properties of Regular languages. 3
- 5 Construct  $\epsilon$ -NFA for the regular expression  $ab(a+b)^*$ . 3
- 6 Eliminate left recursion from the following grammar. 3  
 $E \rightarrow E+T \mid T$   
 $T \rightarrow T*F \mid F$   
 $F \rightarrow (E) \mid id$
- 7 State and give formal definition of DFA. 2
- 8 Briefly explain multiple track TM's. 3
- 9 What is a satisfiability problem? Give an example. 2
- 10 What is halting problem in turing machines. 2

**PART – B (50 Marks)**

- 11 Convert the following E-NFA to DFA. 10



- 12 State and prove pumping Lemma for regular languages. 10

	0	1
$\rightarrow q_1$	$q_2$	$q_3$
$q_2$	$q_3$	$q_5$
$* q_3$	$q_4$	$q_3$
$q_4$	$q_3$	$q_5$
$* q_5$	$q_2$	$q_5$

- 13 a) Write regular expression for the using having even no. of a's and even no. of b's over  $\Sigma = \{a, b\}$ . And draw the DFA. 5
- b) Briefly explain Homomorphism with an example. 5
- 14 Explain the conversion of a grammar to CNF with an example. 10
- 15 Construct a TM to accept the language  
 $L = \{a^n b^n c^n \mid n \geq 1\}$  10
- 16 a) Write short notes on restricted TM. 6
- b) Briefly explain universal TM. 4
- 17 State and explain Rice theorem. 10

\*\*\*\*\*