

**FACULTY OF ENGINEERING****B.E. 4/4 (Civil) I – Semester (Suppl) Examination, May / June 2018****Subject: Concrete 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  | Define water cement ratio and gel space ratio.                       | 2 |
| 2  | Give any one relation between mechanical properties of the concrete. | 3 |
| 3  | What are the IS codes used for the testing cement and concrete?      | 2 |
| 4  | What is target strength for M30 grade concrete?                      | 2 |
| 5  | Define mineral and chemical admixtures.                              | 3 |
| 6  | Explain the curing of concrete.                                      | 3 |
| 7  | Give IS specifications required for the design concrete mixes.       | 3 |
| 8  | Where the high performance concrete is used.                         | 2 |
| 9  | What is fiber reinforced concrete?                                   | 2 |
| 10 | Explain self curing concrete.                                        | 3 |

**PART – B (5x10 = 50 Marks)**

- |       |                                                                                                          |    |
|-------|----------------------------------------------------------------------------------------------------------|----|
| 11 a) | Explain in detail segregation and bleeding of concrete.                                                  | 5  |
| b)    | Explain the maturity concept in concrete curing with suitable examples.                                  | 5  |
| 12 a) | Differentiate between IS method of mix design and ACI method of mix design.                              | 4  |
| b)    | Design a mix for M20 grade concrete assume all the physical properties of the concrete making materials. | 6  |
| 13 a) | Discuss the advantages of mineral and chemical admixtures in concrete.                                   | 5  |
| b)    | Discuss the durability aspects of PPC based concrete.                                                    | 5  |
| 14    | Discuss in detail the role of admixtures in concrete and their chemical reactions.                       | 10 |
| 15    | Explain the applications of high performance concrete.                                                   | 10 |
| 16 a) | Discuss the mechanical properties and applications of fiber reinforced concrete.                         | 5  |
| b)    | Briefly explain the applications of high density concrete.                                               | 5  |
| 17    | Discuss in detail the recycled aggregate concrete and high density concrete.                             | 10 |

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**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) I – Semester (Suppl.) Examination, May / June 2018****Subject: Mobile Cellular Communications****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 List the fundamental limitations of conventional mobile telephone systems. 2
- 2 Distinguish between near-end and far-end effect w.r.t mobile cellular communication system. 2
- 3 Calculate the far field distance for an antenna with maximum dimension of 1m and operating frequency of 900 MHz. 3
- 4 Briefly explain the three basic propagation mechanisms. 3
- 5 Write the important features of TDMA. 2
- 6 Explain the difference between Frequency Hopping Multiple Access (FHMA) and traditional FDMA. 2
- 7 List different logical channels of CDMA forward link and state their functionalities. 3
- 8 In CDMA system, each channel transmission data rate is 9.6 kbps and a channel chip rate is 1.2288 M chips per sec. Calculate the spreading factor and processing gain. 3
- 9 Write the key technology features of 4G cellular systems. 3
- 10 Write some applications of Bluetooth technology. 2

**PART – B (5x10 = 50 Marks)**

- 11 a) What is handoff? Discuss the handoff strategies that are used in 1G, 2G and 3G cellular communication systems. 5
- b) A cellular communication system uses a frequency reuse factor  $N=4$ . If the path loss exponent  $n=4$  and cell radius  $R=5$  km, estimate the following in dB, (Assume a hexagonal cell layout) 5
  - i) The Signal to Interference Ratio (SIR) of the system with no cell sectoring.
  - ii) The Signal to Interference Ratio (SIR) of the system when  $60^\circ$  cell sectoring is used.
  - iii) The Signal to Interference Ratio (SIR) of the system when  $120^\circ$  cell sectoring is used. Comment on the results obtained.
- 12 a) Derive an expression for received signal strength for free space propagation model. 5

- b) A unit gain antenna with a maximum dimension of 1 m produces 50 W power at 900 MHz. Calculate
- i) The transmit power in dBm
  - ii) The received power in dBm at a free space distance of 100 m. 5
- 13 a) What is Spread Spectrum Multiple Access (SSMA)? Discuss different types of SSMA techniques. 5
- b) Determine the maximum through-put that can be achieved using ALOHA and Slotted ALOHA protocols. 5
- 14 a) Draw the block diagram of CDMA for reverse channel modulation process and explain. 5
- b) What is Carrier Sense Multiple Access (CSMA) protocol? Compare the performance of the following CSMA protocols.
- i) Non persistent CSMA
  - ii) 1-Persistent CSMA
  - iii) P-Persistent CSMA 5
- 15 a) Describe different IEEE standards, specifications and applications of Wireless Local Area Network (WLAN) 5
- b) Discuss the radio interface specifications of CDMA 2000. 5
- 16 a) Describe the functions of radio sub system of GSM. 5
- b) Draw the architecture block diagram of Universal Mobile Telecommunication System (UMTS) and explain its salient features. 5
- 17 Write short notes:
- a) Trunked radio system 5
  - b) Parameters of mobile multipath channels. 5

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**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) I - Semester (Suppl.) Examination, May / June 2018****Subject : Entrepreneurship (Elective-II)****Time : 3 Hours****Max. Marks: 75***Note: Answer all questions from Part-A & any five questions from Part-B.***PART – A (25 Marks)**

1. Define entrepreneurship. (2)
2. What are the salient features of small scale industries? (3)
3. Differentiate between manager and an entrepreneur. (2)
4. Explain briefly about first generation entrepreneurs. (2)
5. What are the various sources of project financing in India? (2)
6. List out various factors to be considered in choosing the right technology. (2)
7. Define a project and mention different parameters to be considered in object formulation. (3)
8. Discuss about significant features of marketing analysis. (3)
9. What is behavior? And explain the role of motivation in behavior of an Entrepreneur. (3)
10. Define personality and list out its various attributes. (3)

**PART – B (5x10=50 Marks)**

- 11.(a) List out various opportunities and challenges of entrepreneurs in Indian context. (5)
- (b) Explain the role of entrepreneurs in developing the economical status of a country. (5)
- 12.(a) Explain in detail about women entrepreneurs by highlighting the favourable conditions for them in Indian context. (5)
- (b) Define an Idea and elaborate various methods used for Idea generation. (5)
13. What is project formulation? Explain in detail about marketing, financial and technical analysis in project formulation. (10)
14. Discuss in detail about the concept and salient features of PERT and CPM techniques and explain their role in helping an entrepreneur in successful completion of a project. (10)
- 15.(a) What is leadership? How many entrepreneur develops leadership qualities required to be successful in his profession? (5)
- (b) Explain in detail about Time management matrix. (5)
- 16.(a) Discuss about the concept of assessment of text burden and how it will be helpful to an entrepreneur in planning and managing finance effectively. (5)
- (b) "Entrepreneurs are made not born". Give your views with proper justification. (5)
17. Write short notes on any three of the following : (10)
  - (a) Partnership firm
  - (b) Large scale industries
  - (c) Human aspects in project management
  - (d) Change behaviour

**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) I-Semester (New)(Suppl.) Examination, May / June 2018****Subject : Optimization Techniques****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. Distinguish between basic and non basic variables. (2M)
  1. Suppose the problem has many optimal points. From the final table of the Simplex algorithm, state the criteria. (3M)
3. What is the rate convergence in Fibonacci method. (2M)
4. What is the significance of  $\gamma$  and  $\beta$  in Simplex method. (2M)
5. What are the draw backs of exhaustive search. (3M)
6. Write the expression for updating the search direction in conjugate gradient method. (3M)
7. State the significance of KT points. (3M)
8. State the Metropolis criterion. (2M)
9. State the criteria for selection of mutation probability. (3M)
10. State the schema theorem. (2M)

**PART – B (50 Marks)**

11. a) Maximize  $F = x+3y$  (6M)
 

Subject to

$-4x +3y \leq 12$

$x+y \leq 7$

$x-4y \geq 2$

$x, y \geq 0.$

b) What is the effect in the solution if the right side value is changed from 7 to 5. (4M)
12. a) Compare Simplex and Revised Simplex algorithms. (4M)
 

b) A carpenter has to manufacture chairs and tables from available resources which consists of 400 cft of wood and 450 man hours. The carpenter needs 5 cft of wood and 10 man-hours for a chair and 20 cft of wood and 15 man hours for a table. The carpenter gets a profit of Rs. 45 and Rs. 80 for a chair and table respectively. Formulate the problem to get maximum profit. (6M)

-2-

13. a) Explain the steepest descent algorithm. (4M)
- b) Check whether the given direction S at the point  $x^{(0)}$  is descent or not for the function (6M)
- $$f(x) = 2x_1 + x_2 - 2x_1x_2 + 4$$
- Where  $S = (1, 1)$  and  $x^{(0)} = (2, 3)^T$ .
14. a) State the advantages of cutting plane method. (4M)
- b) For an optimization problem, the following constraint set is given: (6M)
- $$g(x) = x_1^2 + 4x_2^2 - 4 \geq 0 \quad \& \quad 3 \geq x_1, x_2 \geq 0.$$
- The current point is  $x^{(t)} = (1, 0.5)^T$ . Construct a cutting plane at  $x^{(t)}$ .
15. a) Compare SA & GA algorithms. (5M)
- b) Explain the SA algorithm with flow chart. (5M)
16. Maximize  $f(x) = (x_1 - 1.5)^2 + (x_2 - 4)^2$  (10M)
- Subject to  $0 \leq x_1, x_2 \leq 2$  upto two decimal places using GA. Choose  $p_c = 0.25$  and  $p_m = 0.01$ .
17. Write short notes on any two. (10M)
- a) Pattern search method.
- b) Univariate method.
- c) Monte Carlo method.

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**FACULTY OF ENGINEERING**

**BE 4/4 (ECE) I - Semester (New)(Supplementary) Examination, MAY /June 2018**  
**Subject : System Automation and Control (Elective – II)**

Time: 3 Hours

Max Marks: 75

**Note:** Answer all questions from Part-A & Any questions From Part-B.

**Part - A (25 Marks)**

1. Explain Hysteresis error 2
2. Why do we use mathematical models for systems? 2
3. Mention a few real world applications of motion control 2
4. Draw ladder diagram for AND and NOR logic functions 3
5. What do you mean by closed loop controller? 2
6. List the criteria for selection of sensors. 3
7.  $G_1(s) = 1/s$ ,  $G_2(s) = 4/s(s+1)$  AND  $H(s)=K$ . Find the overall transfer function for a negative feedback system 3
8. Draw the industrial automation pyramid. 3
9. What is the importance of sensing in automation? 2
10. Explain calibration of an instrument using a figure. 3

**PART – B (50 Marks)**

11. What is industrial automation? Explain in detail the role of automation in industry 10
12. a) Explain hydraulic and pneumatic building blocks with the help of describing equations and energy stored/power dissipated 6  
b) Explain the rotational-translational system using a suitable example. 4
13. a) Explain the methods used for measurement of temperature 6  
b) How does temperature measurement help in control of the heat exchanger? 4
14. a) Explain in detail the PLC architecture using a block diagram 7  
b) Explain the salient features of a programmable communication interface 3
15. a) Using a block diagram explain the components of a motion control system 5  
b) What are the motor technologies used in motion control systems and where do they find application? 5
16. Explain the number of ways in which a control unit reacts for correcting elements. Use detailed diagrams 10
17. Write short notes on 10
  - a) Data acquisition systems
  - b) End – effectors
  - c) Ports in microcontroller

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## FACULTY OF ENGINEERING

**B.E. 4/4 (ECE) I-Semester (New) (Suppl.) Examination, May /June 2018**  
**Subject: Internet of Things (Elective – I)**

**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. Enlist three applications of IoT for smart energy                                 | 3 |
| 2. Briefly explain the concept of SaaS in cloud computing                            | 2 |
| 3. Mention characteristics of UDP.                                                   | 2 |
| 4. What is the role of Proxy server.                                                 | 3 |
| 5. What is an Arduino shield. Give examples                                          | 2 |
| 6. Write a code in C language for Arduino to blink alternate LEDs in a set of 8 leds | 3 |
| 7. What is REST. Give name of a few methods in REST                                  | 3 |
| 8. What is polling. What is its effect on system latency.                            | 2 |
| 9. Explain date and time operation in python with example                            | 3 |
| 10. Mention various flavours of linux that support Raspberry Pi                      | 2 |

### PART B

**Note: Answer any five questions**

- |                                                                                                            |       |
|------------------------------------------------------------------------------------------------------------|-------|
| 11. a) What is autonomic computing? Mention in details the properties of an autonomic IoT system           | 6     |
| b) What is objective of smart transportation and list the features of electric Cars.                       | 4     |
| 12. a) Draw the TCP/IP model and explain the role of each layer                                            | 6     |
| b) List the main functions of a Data Collection and Analysis(DCA) module                                   | 4     |
| 13. a) What are the features to be considered for choosing the right hardware platform for IoT prototyping | 6     |
| b) Briefly explain the types of 3D printers                                                                | 4     |
| 14. a) What is the reason for latency in HTTP on an Arduino board                                          | 6     |
| b) What is stack overflow, what are the various techniques to avoid stack overflow                         | 4     |
| 15. a) Write a python program for sending and email on switch press                                        | 6     |
| b) What are the various rounds involved in funding an IoT start up company                                 | 4     |
| 16 a) Write a python program for controlling LED with a switch for Raspberry Pi                            | 5     |
| b) Explain the key concepts of WAMP                                                                        | 5     |
| 17. Write short notes on                                                                                   |       |
| A) SHIM service    B) Arduino Vs Raspberry Pi    C) Skynet IoT Messaging platform                          | 3+4+3 |

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**FACULTY OF INFORMATICS****B.E. 4/4 (IT) I-Semester (Suppl) Examination, May /June 2018****Subject: Intellectual Property Rights  
(Elective – II)****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 are the conditions for assignments of trademark?
2. What do you mean by intellectual property? What are the different types of IPR?
3. What is the need for PCT? How are patent applications under PCT handled?
4. Write any three differences between TRIPS and TRIMS.
5. Can a published or disclosed invention be patented?
6. What do you mean by compulsory licencing?
7. What do you understand by the right of priority and what is its significance?
8. What are the various conventions related to IPR? Name them.
9. What are the principal features of the Paris Convention?
10. What is the Budapest Treaty?

**PART-B (5x10 = 50 Marks)**

11. Explain the procedure for registration of trade marks. What are the effects of registration of trade mark?
12. Explain the rights and limitations of registered proprietor of a trade mark
13. Discuss the rights of author/owner protected under Copyright law.
14. What are the basic principles of Berne Convention? Discuss.
15. Industrial design plays an important role in the trading of consumer goods or products as well as helps in economic development by encouraging creativity in the industrial and manufacturing sector. Discuss briefly the legal protection available to a registered design and state the consequences for the piracy of a registered Design?
- 16 a) What is a trade mark?. Function of a Trade Mark. Explain the evolution of Trade Mark Law.  
b) What are the marks that can be registered as Trademarks? What is the procedure for Registration of Trade Mark.
17. Write notes on any three of the following:
  - a) Paris Convention
  - b) Duration of Trade Mark
  - c) Deceptive Similarity
  - d) Domain Names.

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**FACULTY OF INFORMATICS****B.E. 4/4 (IT) I – Semester (Supplementary) Examination, May / June 2018****Subject : Distributed Systems (Elective-II)****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 is open distributed system?                                                   | 2 |
| 2  | What are scaling techniques?                                                       | 3 |
| 3  | What is static RMI and dynamic RMI?                                                | 2 |
| 4  | Explain the difference between transient and persistent communication of messages. | 3 |
| 5  | What are advantages of user-level threads?                                         | 3 |
| 6  | Define mounting point and mount point.                                             | 2 |
| 7  | Define interface repository and implementation repository in CORBA.                | 2 |
| 8  | What is active directory in DCOM.                                                  | 3 |
| 9  | Define the characteristics of multimedia data.                                     | 3 |
| 10 | What is real-time scheduling?                                                      | 2 |

**PART – B (50 Marks)**

- |    |                                                                                                         |    |
|----|---------------------------------------------------------------------------------------------------------|----|
| 11 | a) Define transparency. Explain different types of transparency with examples.                          | 5  |
|    | b) Give differences between homogeneous multi computer systems and heterogeneous multi computer system. | 5  |
| 12 | Explain message-oriented persistent communication in detail.                                            | 10 |
| 13 | a) Explain about software agents in distributed systems.                                                | 5  |
|    | b) Explain different layers in the implementation of Name space.                                        | 5  |
| 14 | a) How does process-to-object binding takes place in Globe? Explain.                                    | 5  |
|    | b) Explain about security service in DCOM.                                                              | 5  |
| 15 | Explain the quality of Service Management in distributed multimedia systems.                            | 10 |
| 16 | a) Explain simple solutions for locating mobile entities.                                               | 5  |
|    | b) Explain Resource Management in Distributed Multimedia systems.                                       | 5  |
| 17 | Write short notes on the following :                                                                    |    |
|    | a) Distributed objects in RMI                                                                           | 5  |
|    | b) Services of CORBA                                                                                    | 5  |

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**FACULTY OF ENGINEERING****B.E. (Civil) IV - Semester (CBCS) (Main) Examination, May/June 2018****Subject : Hydrology and Water Management****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 are the different types of precipitation? (2)
- 2 How the Rainfall data is presented? (2)
- 3 Discuss the factors affecting Evaporation? (2)
- 4 What is stream gauging? (2)
- 5 Draw a typical flood hydrograph and show the various components. (2)
- 6 Distinguish between aquifer and aquifuge. (2)
- 7 Explain the term cone of depression. (2)
- 8 Write the relation between duty and delta. (2)
- 9 Explain the vertical distribution of soil moisture. (2)
- 10 Define Correlation Coefficient. (2)

**PART- B (50 Marks)**

- 11 (a) Explain with sketch Thiessen's polygon method for calculating average depth of precipitation over an area. Discuss the relative merits and demerits of this method over the others. (5)
- (b) In a certain catchment basin there are four rain gauge stations, with their normal annual rainfall amounting to 800, 520, 440 & 400 mm respectively. Determine the optimum number of rain gauges in the catchment if it is desired to limit the error in the mean value of rainfall in the catchment to 12%. (5)
- 12 (a) What is Transpiration and what are the factors that affect the rate of transpiration? (5)
- (b) The Total observed runoff volume during a 6 hr storm with a uniform intensity of 1.5 cm/hr is  $21.6 \times 10^6 \text{ m}^3$ . If the area of the basin is  $300 \text{ km}^2$ , find the average infiltration rate for the basin. (5)
- 13 (a) What is the design flood? Explain how you estimate the design flood using frequency analysis. (5)
- (b) The direct runoff hydrograph resulting from a 4 cm of effective rainfall of 6 hr duration are given below. Determine the area of the catchment and the ordinates of the 6hr unit hydrograph. (5)

Time (hrs)	0	6	12	18	24	30	36	42	48	54	60	66	72
Direct runoff(m <sup>3</sup> /sec)	0	22	172	317	357	307	227	162	102	57	27	7	0

- 14 (a) Explain in brief the aquifer parameters. (5)
- (b) An unconfined aquifer has a thickness of 30 m. A fully penetrating 20 cm diameter well in this aquifer is pumped at a rate of 35 lit/sec. The draw down measured in two observation wells located at distances of 10 m and 100 m from the well are 7.5 m and 0.5 m respectively. Determine the average hydraulic conductivity of the aquifer. At what distance from the well the drawdown is insignificant? (5)

- 15 (a) Define Discrete Random variable and Continuous Random variable with examples. (5)
- (b) Compute the Mean, Standard deviation and Skewness coefficient of the observed annual flood peaks of a river in  $\text{m}^3/\text{s}$  for a period of 20 years are 190,155,298,136,137,131,140,124,185,104,91,154,109,269,164,270,142,72,130&111. (5)
- 16 (a) Discuss the benefits and ill-effects of irrigation. (5)
- (b) A village has 2000 hectares of CCA, out of which 20% area is under the cultivation of perennial crop i.e. Sugar cane, 50% area is under Wheat cultivation whose duty at the head of the outlet is 2000hectare/cumec. Duty of sugarcane is 700 hectare/cumes. If demand of water during kor period increased by 20 percent of the average demand. Find out the discharge for which village water course has to be designed. (5)
- 17 Write short notes on (10)
- a) Soil-Water-Plant relationship
  - b) Irrigation efficiencies
  - c) Factors influencing runoff

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**FACULTY OF ENGINEERING**

**B.E (EEE) IV- Semester (CBCS) (Main) Examination, May / June 2018**

**Subject: Electrical Circuits-II**

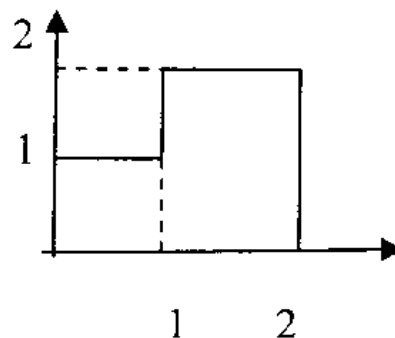
**Time: 3 Hours**

**Max. Marks: 70**

Note: Answer All Questions From Part-A, & Any Five Questions From Part-B.

**Part-A (20 Marks)**

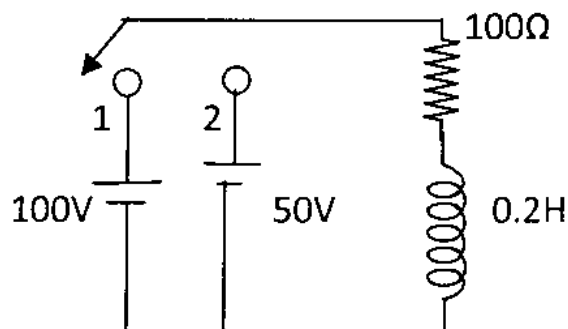
1. List out the symmetry conditions of Fourier series.
2. Bring out an analogy between Laplace Transform & Fourier Transform
3. Determine the Laplace transform of  $f(t) = \sin^2 t$
4. Explain in brief the concept of stability form pole zero concept
5. List any two properties of PR functions
6. Draw the equivalent circuit of h parameters
7. Explain the terms oriented graph & tree with an example
8. Find the initial & final value of  $F(s) = \frac{9S+10}{S(S+2)}$
9. Find the LT of the following waveform



10. Which type of parameters are used for the following combinations
- a) Series                      b) Parallel                      c) Cascade

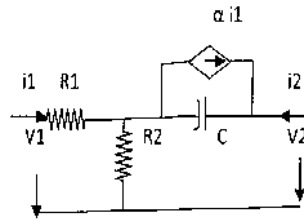
**PART-B (50 Marks)**

- 11 In the series circuit shown the switch is closed on position 1 at  $t=0$  thereby applying the 100V source to the RL branch & at  $t=500\mu\text{sec}$  the switch is moved to position 2. Obtain the equations for current in both the intervals & sketch the transient [10M]



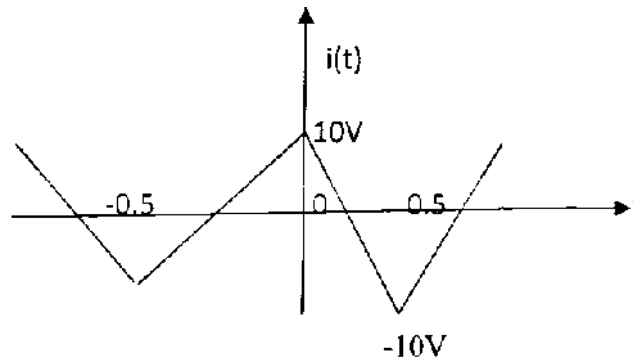
12 Find the h parameters for the following network

[10M]



13 The current in an inductance  $L=1\text{mH}$  has a waveform as shown in fig. Obtain the trigonometric & exponential series for voltage across inductor

[10M]

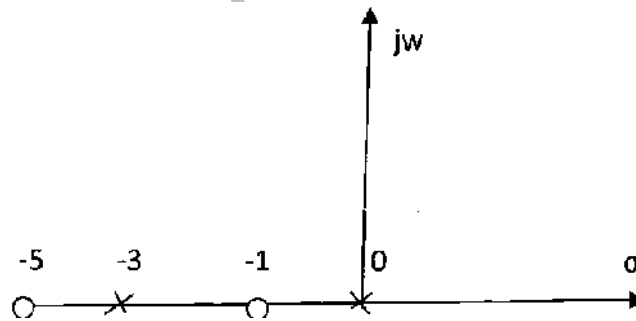


14 Synthesize in two cauer forms  $F(s) = \frac{2(s+1)(s+4)}{(s+2)(s+6)}$

[10M]

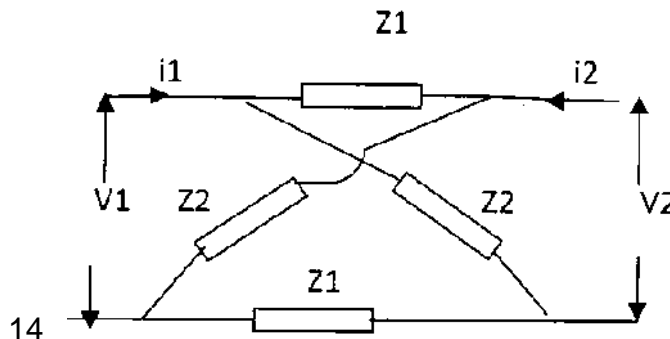
15 An impedance function has the following pole zero pattern shown in fig. If  $Z(-2) = 3$  Synthesize the impedance in one foster & on cauer form

[10M]



16 a) Determine the Z parameters for the given network

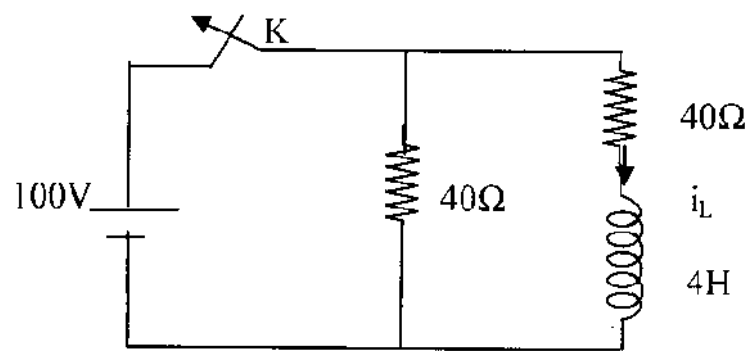
[4M]



b) In the figure shown below the switch K is opened at  $t=0$ , steady state reached at  $t=0$ . Using the LT find  $I_L(S)$  &  $i_L(t)$ . Also find the value of  $i_L(t)$  at  $t=0.5\text{sec}$

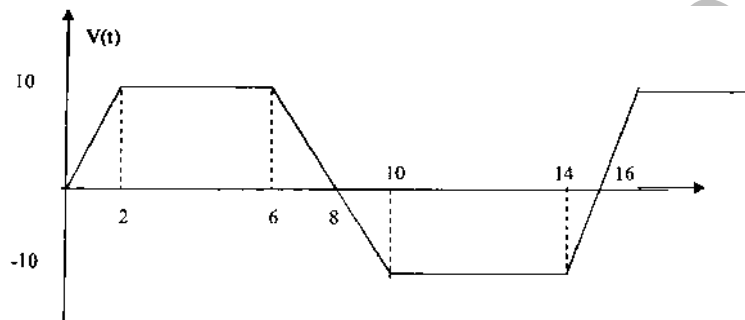
[6M]

-3-

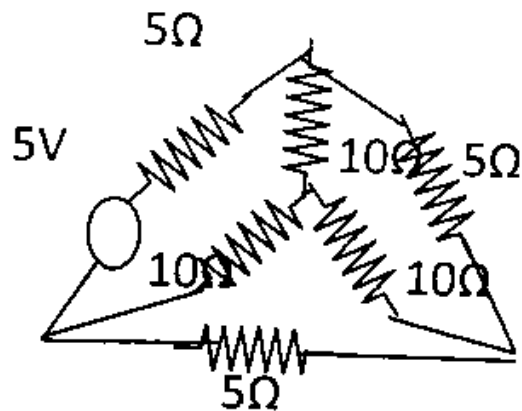


17a) Synthesize the following waveform & find its LT

[5M]



b) Write the tie-set schedule for the network shown & Obtain the equilibrium equation [5M]



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## FACULTY OF ENGINEERING

B.E. (ECE) IV – Semester (CBCS) (Main) Examination, May / June 2018

Subject: Electromagnetic Theory & Transmission Lines

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 Determine Unit vector directed from the origin towards point G(2,-2,1) (2)
- 2 Find  $a_x$  in spherical coordinate system at P(3, -4,5) (2)
- 3 What are the limitations of Coulomb's Law? (2)
- 4 State and prove Biot Savart's Law? (2)
- 5 State Maxwell's equations. (2)
- 6 State Poynting Theorem? (2)
- 7 State significance of Primary and Secondary Constants of transmission line. (2)
- 8 State the condition for Distortion less Transmission Line? (2)
- 9 Define Reflection Coefficient & VSWR of a Transmission Line? (2)
- 10 What are the applications of Smith Chart? (2)

### PART – B (50 Marks)

- 11 a) Derive an expression for Electric field intensity  $\mathbf{E}$  due to a Line charge? (5)  
 b) Two point charges  $Q_1 = 5 \text{ nC}$  and  $Q_2 = -3 \text{ nC}$  are located at  $P_1(-1.0, 0.8, 2) \text{ mts}$ ;  $P_2(2, 1, -1) \text{ m}$ ; respectively in free space; Find the Electric Field Intensity  $\mathbf{E}$  at  $P(0.5, -0.7, 1) \text{ m}$  (5)
- 12 a) Find the Divergence  $\mathbf{G}$ , at point  $P(2, 3, -4)$ ; if  $\mathbf{G} = (x \mathbf{a}_x + y \mathbf{a}_y + z \mathbf{a}_z)$ ? (5)  
 b) State and prove Poisson's & Laplace equations? (5)
- 13 a) Derive necessary expressions for Scalar and Vector magnetic potentials? (5)  
 b) A filamentary current of 10A is directed in the form in the air from infinity to origin on the positive x-axis; and then back to infinity along positive y-axis. Use Biot-Savart's Law to find  $\mathbf{H}$  at  $P(0, 0, 1) \text{ m}$ ? (5)
- 14 a) State applications of Poynting Theorem? (5)  
 b) A 300MHz wave propagating through fresh water; assuming a lossless medium with permeability  $\mu_r = 1$ ;  $v_r = 78$ ; (at 300MHz) find  $\beta, \theta, \eta, \lambda$  if  $\mathbf{E} = 0.1 \text{ V/mt}$ ? (5)



- 15 a) Define Characteristic Impedance, propagation constant, group and phase velocities of transmission lines. (5)
- b) A  $50 \Omega$  lossless transmission line is operating at 40MHz with a velocity on the line of  $2 \times 10^8$  m/s; If a Load  $Z_L = (60 + j 10) \Omega$  is located at  $Z = 0$ ; find  $Z_{in}$  at  $Z = -2.5\text{mts}$  &  $z = -5\text{mts}$ . (5)
- 16 a) Derive expressions for Single Stub matching? (5)
- b) Describe the method for of impedance matching using Quarter wave line? (5)
- 17 a) Write short notes on Brewster angle, critical angle and total internal reflection? (5)
- b) What is the inconsistency of Ampere's Law? How it is rectified? (5)

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**FACULTY OF ENGINEERING****B.E. 4/4 (M/P/AE) I-Semester (Supplementary) Examination, May / June 2018****Subject : Operation Research****Time : 3 hours****Max. Marks : 75****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (10 x 2.5 = 25 Marks)**

- 1 What areas of operations Research have made a significant impact on decision making process?
- 2 Define and illustrate graphically the following terms :  
i) Feasible solution      ii) Unbounded solution
- 3 What is the use of slack and surplus variables in linear programming?
- 4 What is unbalanced transportation problem it?
- 5 What do you understand by sensitivity analysis?
- 6 Differentiate between group replacement and individual replacement.
- 7 Explain the dominance principle of game theory.
- 8 Define queue discipline.
- 9 What are the assumptions of sequencing models?
- 10 Define Jockeying.

**PART – B (50 Marks)**

- 11 Use Big-M method to solve following LPP
- 10

$$\text{Minimize } Z = 600x_1 + 500x_2$$

Subjected to constraints

$$2x_1 + x_2 \leq 80$$

$$x_1 + 2x_2 \leq 60$$

$$x_1, x_2 \geq 0$$

- 12 Maximize
- $Z = 2x_1 + 2x_2$

Subjected to constraints

$$x_1 + 2x_2 \leq 1$$

$$2x_1 + x_2 \leq 1$$

$$x_1, x_2 \geq 0$$

- 13 a) What is degeneracy in transportation problem. 3  
 b) How should the jobs be allocated, one per employee, so as to minimize the total man-hours? 7

		Employees				
		P	Q	R	S	T
Jobs	A	85	75	65	125	75
	B	90	78	66	132	78
	C	75	66	57	114	69
	D	80	72	60	120	72
	E	76	64	56	112	68

- 2 -

- 14 a) Explain theory of replacement used in replacement of items that completely fail. 3  
 b) Solve the game whose payoff matrix is given. 7

		Player B			
		B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	B <sub>4</sub>
Player 1	A <sub>1</sub>	2	-2	4	1
	A <sub>2</sub>	6	1	12	3
	A <sub>3</sub>	-3	2	0	6
	A <sub>4</sub>	2	-3	7	1

- 15 A flow shop has two machines and five jobs. The processing time matrix is given below. Determine optimal make span and draw the Gantt chart to corresponding sequence. 10

Job	M/C 1	M/C 2
A	2	10
B	3	8
C	7	5
D	9	1
E	6	4

- 16 a) Define: Rate of service, arrival pattern, Kendall-Lee notation. 3  
 b) The mean arrival rate to a service centre is 3/hr and the service time is 10 min. 7  
 i) Probability of two units in the system  
 ii) Expected length of non empty event  
 iii) Expected numbers of units in system  
 iv) Expected time a customer has to wait in system in minutes.
- 17 Write short notes on  
 a) Primal LPP Vs. Dual LPP 5  
 b) Travelling Sales Men problem 5

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**FACULTY OF ENGINEERING****B.E. 4/4 (CSE) I-Semester (Supplementary) Examination, May / June 2018****Subject : Principles and Applications of Embedded Systems****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 role of CPSR register in ARM process.                           | 2 |
| 2  | Compare 'traps' and 'supervisor mode' for embedded computing.             | 3 |
| 3  | Draw the various stages of pipeline in ARM7 processors.                   | 3 |
| 4  | Distinguish between CISC and RISC architecture.                           | 3 |
| 5  | Compare task scheduling and resource monitoring activities in RTOS.       | 3 |
| 6  | What is Re-entrancy? What is the role of Re-entrant function?             | 2 |
| 7  | What are the applications of Distributed Embedded computing?              | 2 |
| 8  | What are the merits and demerits of multiprocessors for embedded systems? | 3 |
| 9  | What is meant by scaffold code? Write its advantages.                     | 2 |
| 10 | What is the difference between native linker and locator?                 | 2 |

**PART – B (50 Marks)**

- |    |                                                                                                                                                                     |    |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 11 | a) Describe the various design challenges of Embedded system.                                                                                                       | 4  |
|    | b) Explain the detailed requirements, specification and design process of GPS.                                                                                      | 6  |
| 12 | a) Explain the process of Platform-level performance analysis consideration.                                                                                        | 6  |
|    | b) What is DMA? How can the concurrency achieved during DMA?                                                                                                        | 4  |
| 13 | Consider task 'A' and 'B' are an interrupt sequence routine (ISR) sharing the data variable X. Explain the problem of sharing X and give the appropriate solutions. | 10 |
| 14 | Explain the following scheduling algorithms with example :                                                                                                          |    |
|    | a) Real time round Robin scheduling algorithms.                                                                                                                     | 3  |
|    | b) Rate Monotonic Scheduling (RMS)                                                                                                                                  | 4  |
|    | c) Earliest-deadline-first Scheduling (EDF)                                                                                                                         | 4  |
| 15 | a) What are the hard real-time scheduling considerations? Explain various methods for saving memory in RTOS.                                                        | 6  |
|    | b) Describe the various methods for Getting Embedded software into the Target System.                                                                               | 4  |
| 16 | a) Explain the process of testing embedded systems using Laboratory Tools.                                                                                          | 5  |
|    | b) Explain the Architecture of distributed Embedded Systems with example.                                                                                           | 5  |

17 Explain any Two of the following :

- a) Write short notes on SHARC interrupts 5
- b) Explain the relation between various cache levels. 5
- c) Write a program for the following instructions using ARM instruction set 5

```
If(a>c)
{
    Y = a+d;
}
Else
{
    Z = a < 2 ;
    W = c>>2;
    X = W+Z
}
```

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OU - 1607 OU - 1607

**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) I-Semester (New) (Supplementary) Examination, May/June 2018****Subject : Digital Signal Processor and Architecture (Elective-II)****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 Draw the butterfly diagram for 4-points DITFFT. 2
- 2 Prove that the dynamic range of a signal increases by 6dB for each additional bit used to represent its value. 3
- 3 What is the role of a Barrel shifter in DSP? 3
- 4 List the features of TMS320C54x processor. 2
- 5 Why special addressing modes are required in DSPs? 3
- 6 Draw the register format of status register ST0 of a TMS320C54x DSP. 3
- 7 What are the features of ADSP218 processor? 2
- 8 List the various registers available in multiplier unit of ADSP218x processor. 2
- 9 How many address lines are required to access all locations of a 16K x 16 SRAM? 2
- 10 List the on chip peripherals of Programmable DSP processor. 3

**PART – B (50 Marks)**

- 11 a) Describe briefly about sources of errors in DSP processor. 5  
b) Discuss in brief the Q-Notation system and its importance. 5
- 12 a) Explain with a block diagram a basic DSP system. What are the advantages and disadvantages of programmable DSP processors. 6  
b) Explain the features for external interfacing. 4
- 13 a) Explain the concept of pipelining and how pipeline depth is measured. 5  
b) Assume that the current contents of AR3 to be 400 h, what will be its contents after each of the following TMS 320 C 54 xx addressing mode is used? Assume that the contents of AR0 are 40 h. i) \*AR3+0 ; ii) \*AR3+ ; iii) \*AR3 + OB 5
- 14 a) Explain the architecture of Arithmetic unit of ADSP218x processor with diagram. 5  
b) Draw and discuss the working of DIVS instruction in ADSP218x processor. 5
- 15 a) Explain a data memory system with address range 000800h-000FFFh for C5416 processor using 2Kx8 SRAM memory chips. 5  
b) Explain the significance of external bus interfacing signals. 5

- 16 a) A signal consists of spectrum in the range 0-5 KHz which is to be sampled so that no aliasing results. Determine the minimum sampling rate can be used to sample the signal. If the sampling rate must be 8 KHz, determine the type and the cutoff frequency of the anti-aliasing filter. 4
- b) Explain the addressing modes of TMS320C54x processor. 6
- 17 Write short notes on : 10
- a) instruction set of TMS320C54X processor
- b) Direct Memory Access (DMA)

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OU - 1607 OU - 1607

**FACULTY OF ENGINEERING****B.E. (Inst.) IV-Semester (CBCS) (Main) Examination, May / June 2018****Subject : Electrical Machines****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  | State Lenz's law.                                                                           | 2 |
| 2  | What is the function of a commutator?                                                       | 2 |
| 3  | Why do you mean by armature reaction in a dc machine?                                       | 2 |
| 4  | Explain the principle of operation of a Transformer with diagram.                           | 2 |
| 5  | What is synchronous condenser?                                                              | 2 |
| 6  | Give the purpose of open circuit test in a transformer.                                     | 2 |
| 7  | Explain what is rotating magnetic field and how this is made use of in electrical machines. | 2 |
| 8  | Define slip in a three phase induction motor.                                               | 2 |
| 9  | List the applications of a stepper motor.                                                   | 2 |
| 10 | What is a capacitor-start and capacitor-run motor?                                          | 2 |

**PART – B (50 Marks)**

- |       |                                                                                                                                                                                                                                                                                                                                       |   |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 11 a) | Draw and explain the external characteristics of shunt, series and compound generators.                                                                                                                                                                                                                                               | 4 |
| b)    | A 4-pole lap wound dc shunt generator has flux per pole of 0.07 Wb. The armature winding consists of 220 turns, each turn having a resistance of 0.004 ohms. Calculate the terminal voltage when running at 1000 rpm if the armature current is 60 A.                                                                                 | 6 |
| 12 a) | Derive an expression for torque of a dc motor. Hence draw torque v/s current characteristics of a dc shunt motor.                                                                                                                                                                                                                     | 5 |
| b)    | A 250-V, 4-pole shunt motor has two-circuit armature winding with 500 conductors. The armature circuit resistance is 0.25 ohm, field resistance is 100 ohms and the flux per pole is 0.02 Wb. Neglect armature reaction. If the motor draws 14.5 A from the mains, then compute the speed and the gross (internal ) torque developed. | 5 |
| 13 a) | Obtain the equivalent circuit of a single-phase transformer. Explain how to evaluate the equivalent circuit of a transformer from open circuit and short circuit tests.                                                                                                                                                               | 5 |
| b)    | A 5 kVA, 220/110 volts, 1-phase transformer has a maximum efficiency of 96.97% at 0.8 p.f. lagging. It has a core loss of 50 watts and the full load regulation at 0.8 p.f. lagging is 5%. Find the efficiency and regulation at full load 0.9 p.f. lagging.                                                                          | 5 |



- 14 a) What is armature reaction? Explain the effect of armature reaction on the terminal voltage of an alternator at unity power factor load. 5
- b) From the following test results, determine the regulation of a 2 kV single phase alternator delivering a current of 100 A at 0.8 p.f. leading :- Full load current of 100 A is produced on short circuit by a field excitation of 2.5 A. An emf of 500 V is produced on open-circuit by the same current. The armature resistance is 0.8 ohm. 5
- 15 a) Derive the expression for the emf generated in the armature winding of a synchronous machine. 5
- b) Explain the construction and principle of operation of a synchronous motor. 5
- 16 a) Describe the principle of operation of a three phase squirrel cage induction motor. 5
- b) What are the different methods of starting a three phase induction motor? 5
- 17 a) Why a single-phase induction motor is not self-starting? Explain. 4
- b) With a neat sketch, explain the working principle of a split-phase capacitor-run single phase induction motor. 6

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## FACULTY OF ENGINEERING

B.E. (M/P/AE) IV-Semester (CBCS) (Main) Examination, May / June 2018

Subject : Kinematics of Machines

Time : 3 hours

Max. Marks : 70

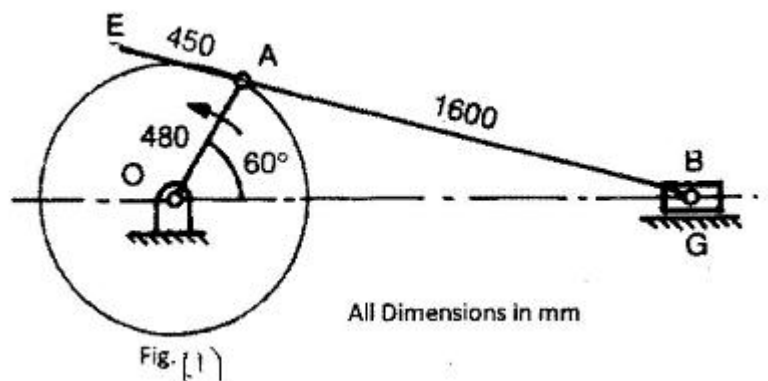
**Note:** Answer all questions from Part-A. Answer any FIVE questions from Part-B.

### PART – A (10 x 2 = 20 Marks)

- 1 Sketch a mechanism with mobility equal to 2.
- 2 Define (a) Body centrode (b) Space centrode
- 3 What is rubbing velocity?
- 4 State Kennedy's velocity.
- 5 Explain the phenomenon of 'slip' and 'creep' in the belt drive.
- 6 With the help of a sketch explain block brake.
- 7 Sketch and define the following cam terminology :  
a) Base circle                      b) Pressure angle
- 8 Draw the displacement diagram of a follower moving with cycloidal motion.
- 9 State law of gearing.
- 10 Sketch and explain working epi-cyclic gear train.

### PART – B (5 x 10 = 50 Marks)

- 11 a) Explain with neat sketches, the inversions of a four-bar chain mechanism.  
b) How are kinematic pairs classified? Explain with examples.
- 12 a) For the configuration of a slider crank mechanism shown in fig (1), calculate (i) the acceleration of the slider at B (ii) The acceleration of point E, when OA rotate at 20 rad/s counter-clockwise.



- b) Prove that a point on one of links of a hart mechanism traces a straight line.
- 13 a) A single-plate clutch transmits 25 kW at 900 rpm. The maximum pressure intensity between the plates is 85 kN/m<sup>2</sup>. The outer diameter of the plate is 360 mm. Both the sides of the plate are effective and the coefficient of friction is 0.25. Determine  
(i) The inner diameter of the plate (ii) the axial force to engage the clutch.

- 2 -

- b) Two parallel shafts, connected by a crossed-belt, are provided with pulleys 480 mm and 640 mm in diameters. The distance between, the centre lines of the shafts is 3 m. Find by how much the length of the belt should be changed if it is desired to alter the direction of rotation of the driven shaft.
- 14 The following data relate to a cam profile in which the follower moves with uniform acceleration and deceleration during ascent and descent : Minimum radius of cam = 25 mm; Roller radius = 5 mm Angle of ascent =  $30^\circ$  ; Angle of descent =  $75^\circ$  ; Angle of dwell between ascent and descent =  $45^\circ$  ; speed of cam = 400 rpm. Draw the profile of the cam and determine the maximum velocity and uniform acceleration of the follower during the outstroke and the return stroke.
- 15 a) Two 200 involute spur gears mesh externally and give a velocity ratio of 3. Module is 3mm and the addendum is equal to 1.1 module. If the pinion rotates at 120 rpm, determine (i) the minimum number of teeth on each wheel to avoid interference (ii) the number of pairs of teeth in contact.
- b) The annulus A in the gear shown in fig.2 rotates at 10,000 rpm about the axis of the fixed wheel-S driven at 600 rpm. Determine the number of teeth required on the wheel P.

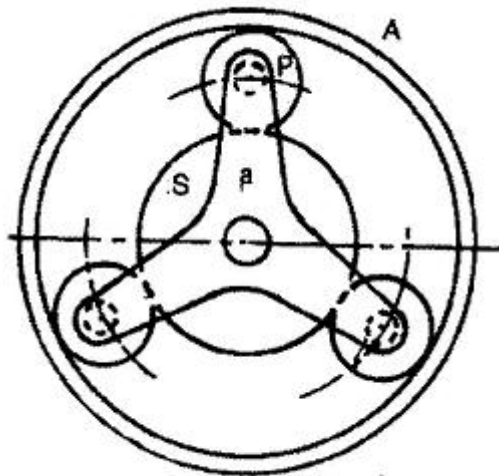


Fig - (2.)

- 16 Explain the any two of the following with a diagram.
- Band and block brake
  - Reverted Gear train
  - Paucellier Mechanism
- 17 Explain any two of the following with a diagram.
- Belt Transmission Dynamometer
  - Types of Brakes
  - Classification of Gear-trains

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**FACULTY OF ENGINEERING****B.E. (CSE) IV-Semester (CBCS) (Main) Examination, May / June 2018****Subject : Programming Languages****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  | Write any four important uses of programming languages.            | 2 |
| 2  | List the design principles of imperative languages.                | 2 |
| 3  | What is type inferenceing?                                         | 2 |
| 4  | What is an alias?                                                  | 2 |
| 5  | What is a named constant? Give an example                          | 2 |
| 6  | What is short circuit evaluation?                                  | 2 |
| 7  | What are guarded commands?                                         | 2 |
| 8  | What is a variable and what are the attribute of a variable?       | 2 |
| 9  | Give an example for fact and rules in logic programming languages. | 2 |
| 10 | What are primitive data types?                                     | 2 |

**PART – B (50 Marks)**

- |    |                                                                                                  |    |
|----|--------------------------------------------------------------------------------------------------|----|
| 11 | a) What are the design issues for names?                                                         | 5  |
|    | b) Distinguish between static type binding and dynamic type binding.                             | 5  |
| 12 | a) Explain BNF and EBNF.                                                                         | 5  |
|    | b) What are the different categories into which we can divide the various programming languages. | 5  |
| 13 | How are parameter passing methods implemented in various languages?                              | 10 |
| 14 | a) What are the design issues for Abstract data types?                                           | 5  |
|    | b) Explain message passing in Ada.                                                               | 5  |
| 15 | a) Explain the basic primitives of LISP. Give suitable examples.                                 | 5  |
|    | b) Explain about concurrency in Ada.                                                             | 5  |
| 16 | Explain the various approaches for expression evaluation in functional programming languages.    | 10 |
| 17 | Write short notes on                                                                             |    |
|    | a) Pointers                                                                                      | 5  |
|    | b) Polymorphism                                                                                  | 5  |

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**FACULTY OF INFORMATICS**

**B.E. (I.T.) IV-Semester (CBCS) (Main) Examination, May / June 2018**

**Subject : Data Communication**

**Time : 3 hours**

**Max. Marks : 70**

**Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.**

**PART – A (10 x 2 = 20 Marks)**

- 1 Distinguish Analog and Digital transmissions.
- 2 Define Delta modulation and PCM.
- 3 Write short notes on HDLC.
- 4 What are different error detection techniques?
- 5 What is wavelength division multiplexing?
- 6 What is xDSL?
- 7 Give Ethernet frame format.
- 8 Define CDMA.
- 9 Write short notes on wireless LAN technology.
- 10 Explain the architecture of Zigbee.

**PART – B (50 Marks)**

- |                                                                      |    |
|----------------------------------------------------------------------|----|
| 11 Explain different data encoding techniques.                       | 10 |
| 12 Describe flow control techniques.                                 | 10 |
| 13 Write short notes on the following :                              |    |
| a) Frequency division multiplexing                                   | 5  |
| b) Wavelength division multiplexing                                  | 5  |
| 14 a) Write short notes on circuit switching.                        | 5  |
| b) Discuss about packet switching.                                   | 5  |
| 15 Explain the architecture of ATM.                                  | 10 |
| 16 Explain the MAC sub layer and physical layer of gigabit Ethernet. | 10 |
| 17 Write short notes on the following :                              |    |
| a) IEEE 802-11 medium access control                                 | 5  |
| b) Architecture of Bluetooth                                         | 5  |

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**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) I – Semester(NEW) (Supple) Examination, May/June 2018****Subject: Embedded System (Elective – II)****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from Part A & any five from Part B****PART – A (25Marks)  
(Answer all questions)**

- |                                                                |    |
|----------------------------------------------------------------|----|
| 1. What are the design metrics used in embedded systems?       | 3M |
| 2. How is the processor selection done for an embedded system? | 2M |
| 3. Differentiate between ARM7 and ARM9                         | 2M |
| 4. Explain the features of RISC processor                      | 3M |
| 5. What are the standards of USB bus                           | 2M |
| 6. Discuss about AMBA Bus                                      | 3M |
| 7. List the features of IDE                                    | 3M |
| 8. What is a loader                                            | 2M |
| 9. Differentiate between host system and target system         | 2M |
| 10. Describe the instruction set simulator                     | 3M |

**PART-B (50 Marks)**

- |                                                                                                                                                 |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 11. a) Explain the process of generating an executable image of embedded software                                                               | 5M  |
| b) Explain the characteristics of embedded system                                                                                               | 5M  |
| 12. a) Mention the register organization of ARM? What are the various modes of ARM core? Explain the concept of mode specific banked registers. | 6M  |
| b) Discuss about data processing instructions of ARM                                                                                            | 4M  |
| 13. Explain in detail about internet enabled systems- network protocols?                                                                        | 10M |
| 14. a) Explain the tools used for getting the embedded software into the target system                                                          | 8M  |
| b) Differentiate between compiler and interpreter                                                                                               | 2M  |
| 15. Discuss about the laboratory tools used in testing and debugging the embedded design                                                        | 10M |
| 16. a) Discuss in detail about embedded SOC                                                                                                     | 5M  |
| b) Explain the frame format of CAN protocol, its physical design and applications                                                               | 5M  |
| 17. Describe a case study of digital camera                                                                                                     | 10M |

## FACULTY OF INFORMATICS

B.E. 4/4 (IT) I-Semester (Suppl) Examination, May /June 2018  
Subject: Ad Hoc and Sensor Networks  
(Elective – II)

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 is Ad Hoc Network?                                                   | (2) |
| <hr/>                                                                        |     |
| 2. List the MAC protocols for wireless networks                              | (2) |
| 3. Describe what is meant by Flooding, with the help of an example           | (3) |
| 4. Discuss the working of Hybrid routing protocol in MANET                   | (3) |
| 5. List the characteristics of QoS-based routing protocols                   | (3) |
| 6. Discuss the RREQ format of AODV routing protocol                          | (3) |
| 7. List the types of potential attacks that can take place in a MANET        | (2) |
| 8. Describe the issues that arise when setting up an Ad Hoc network test bed | (2) |
| 9. List the different types of cross-layer TCP solutions for Ad Hoc networks | (3) |
| 10. Define 'source' and 'sink' in wireless sensor networks                   | (2) |

### PART – B (50 Marks)

- |                                                                                      |      |
|--------------------------------------------------------------------------------------|------|
| 11. a) Explain the architecture of MANET with the help of a neat diagram.            | (5)  |
| b) List and explain the applications and limitations of MANET.                       | (5)  |
| 12. Discuss the issues involved in broadcasting and multicasting in Ad Hoc networks. | (10) |
| 13. a) Explain in detail the working of modified versions of TCP in Ad Hoc network.  | (5)  |
| b) Discuss the applications of wireless sensor networks.                             | (5)  |
| 14. Explain the working of Location based routing (LAR) with the help of example.    | (10) |
| 15. a) Describe the process of routing table maintenance in DSDV routing protocol.   | (5)  |
| b) Discuss the role played by MAC layer in QoS based routing protocol.               | (5)  |
| 16. Explain in detail the Intrusion Detection System architecture in Ad Hoc network. | (10) |
| 17. a) Explain the protocol stack of wireless sensor networks.                       | (5)  |
| b) Describe the sensor taxonomy in detail with the help of a neat diagram.           | (5)  |

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**FACULTY OF INFORMATICS****B.E. 4/4 (IT) I-Semester (Supplementary) Examination, May / June 2018****Subject : Wireless and Mobile Communications (Elective-II)****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 features of 3G cellular networks.                                       | 2 |
| 2  | Mention the differences between soft-handoff and hard-handoff in mobile systems. | 2 |
| 3  | Explain about FDD.                                                               | 3 |
| 4  | Define reflection, diffraction and scattering.                                   | 3 |
| 5  | What is meant by digital modulation?                                             | 2 |
| 6  | Differentiate between CDMA, TDMA, FDMA.                                          | 3 |
| 7  | Differentiate between small-scale, large-scale propagation models.               | 2 |
| 8  | Mention the silent features of GSM.                                              | 3 |
| 9  | List the goals of Mobile IP.                                                     | 2 |
| 10 | Define Tunneling and Encapsulation.                                              | 3 |

**PART – B (50 Marks)**

- |       |                                                                            |    |
|-------|----------------------------------------------------------------------------|----|
| 11 a) | Explain 2G cellular systems in detail.                                     | 6  |
| b)    | State and explain the importance of frequency reuse in cellular systems.   | 4  |
| 12    | Explain about indoor and outdoor propagation models.                       | 10 |
| 13 a) | What is general packet radio service?                                      | 5  |
| b)    | Explain trunking theory.                                                   | 5  |
| 14    | Explain in detail about direct-sequence spread-spectrum technique (DS-SS). | 10 |
| 15    | Explain in detail about Public Switched Telephone Networks (PSTN).         | 10 |
| 16 a) | Sketch GSM system architecture and briefly explain the sub systems.        | 6  |
| b)    | Explain the advantages of CDMA technology.                                 | 4  |
| 17    | Write short notes on the following :                                       |    |
| a)    | Micro-cell zones                                                           | 4  |
| b)    | Wireless local Loop                                                        | 3  |
| c)    | Applications of DHCP                                                       | 3  |

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**FACULTY OF ENGINEERING****B.E. 4/4 (EEE) I – Semester (Main & Backlog) Examination, May / June 2018****Subject: Electrical Machine Design****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part – A & any five questions from Part – B.****PART – A (25 Marks)**

- 1 Which type of materials are suitable for conducting pulsating flux? 2
- 2 What are the leakage fluxes of salient pole machine? 2
- 3 What are the methods employed for the calculation of ampere turns required for tapered teeth? 3
- 4 How to design cross sectional area of poles of D.C. machine? 2
- 5 What are the factors considered for design of main dimensions of synchronous machine? 3
- 6 How to design the yoke of D.C. machine? 3
- 7 What are the different types of magnetic materials? 3
- 8 How to design number of rotor slots of would rotor? 2
- 9 Explain general design procedure for optimization. 3
- 10 Write the kVA rating equation of single phase transformer. 2

**PART – B (50 Marks)**

- 11 a) Derive the cooling equation and draw the cooling curve. 5
- b) A 50 MVA turbo-alternator has a total loss of 1500 kW. Calculate the volume of air required per second and also the fan power if the temperature rise in the machine is to be limited to 30°C. The other data given is 5
 

Inlet temperature of air =	25°C
Barometric height =	760 mm of mercury
Pressure =	8 inches of water
Fan efficiency =	0.4
- 12 a) Explain the design of square and stepped transformer cores. 5
- b) Derive kVA rating equation of three phase transformer. 5

- 13 a) Explain the different armature leakage fluxes of any machine. 5
- b) A 1250 kVA, 3300 Volts, 20 pole, 50 c/s, 3-phase star connected alternator has 150 turns per phase. The stator has a winding factor of 0.9055. Calculate the value of field excitation to overcome the armature ampere turns at full load and zero p.f. lagging if the field turns per pole are 50. 5
- 14 A 6 pole, 220 volt, 200 kW dynamo is to be level compounded. The ampere turns required per pole are 7500 at no load and 9000 at full load. Calculate the number of series turns per pole, and show a suitable arrangement for these turns. The winding length is 15 cm per pole, the field coils are 5 cm thick and fit around a square pole of 23 cm side. Calculate the diameter of shunt field conductor. If insulation increases the diameter by 0.25 mm, calculate also the shunt field current. Resistivity is 0.02 ohm per m and  $\text{mm}^2$ . 10
- 15 Determine the main dimensions, number of stator slots and the number of turns per phase of a 5 HP, 400 volts, 3 phase, 4 pole, 50 c/s squirrel cage induction motor to be started by a Star delta starter. Work out the winding details.
- Assume,
- |                             |   |                             |    |
|-----------------------------|---|-----------------------------|----|
| Flux density in the gap     | = | 0.45 Weber per $\text{m}^2$ |    |
| Efficiency                  | = | 0.83                        |    |
| Ampere conductors per meter | = | 23000                       |    |
| Power Factor                | = | 0.84                        | 10 |
- 16 Write the properties of following materials
- a) Ideal insulating material 4
- b) Conducting material 3
- c) Super conducting material 3
- 17 a) Explain computed aided design of 3 phase induction motor. 5
- b) Explain general procedure for optimization. 5