

**FACULTY OF ENGINEERING****B.E. 4/4 (Civil) II – Semester (Main & Backlog) Examination, May / June 2019****Subject: Estimation & Specifications****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions form Part-A and any five questions from Part-B****PART – A (25 Marks)**

- 1 Explain centre line method of estimation with an example? (3)
- 2 Explain the factors to be considered while preparing the detailed estimate. (2)
- 3 What are lead and lift charges? (2)
- 4 State and explain the three methods for calculation of earth work? (3)
- 5 How is steel reinforcement paid in construction work? (3)
- 6 Work out the number of bags required for 10sq.m of 2.5 cm thick cement concrete floors? (2)
- 7 What is a muster roll? (3)
- 8 What earnest money deposit and security money deposit? (2)
- 9 What is a work order? (3)
- 10 Explain about tender form and tender notice (2)

**PART – B (5x10 = 50 Marks)**

- 11 a) What is an estimate? Explain significance of an estimate. (5)  
b) What are the various items to be included in an estimate? (5)
- 12 Estimate the following items from the Fig.1 by using centre line method. (10)  
i) Excavation of foundation  
ii) First class brick work from ground to plinth
- 13 Prepare an estimate for the portion of a road between chainage 14 to 22 from the data given below draw the longitudinal section of road. Turfing with the grass sods shall be provided for the sides of the embankment at Rs2.00 per sqm. The rate of embankment is cutting is Rs 8.50 per cum and embankment Rs 7.50 cum. The formation width of proposed road is 12m. Side slope  $1\frac{1}{2}:1$  in cutting and 2:1 in banking.

Chainag (30m)	14	15	16	17	18	19	20	21	22
Ground level	108.6	109.25	109.4	108.85	108.50	107.25	106.80	107.15	107.20

The formation level at chainage 14 is 108.6. The road of formation is proposed at uniform falling gradient 1 in 200 passing through G.L at chainage 14. Length of one chain is 30m. (10)

- 14 The irrigation canal has the following data:  
Bed Width =5m; Top width of left bank =3m  
Top width of right bank =1.5m  
Side slope in cutting =1:1  
Side slope of both banks = $1\frac{1}{2}:1$   
Height of bank from bed =2.55m  
Longitudinal slope =1in500

There is no tranuse slope of bed and ground. Ground levels at 6 consecutive stations at 50m.

Station	1	2	3	4	5	6
Ground level m(RL)	100	100.31	100.52	100.57	99.68	99.21
Bed Level at station 1 m (RL)	98.50					

Estimate the quantity in cutting and embankment. (10)

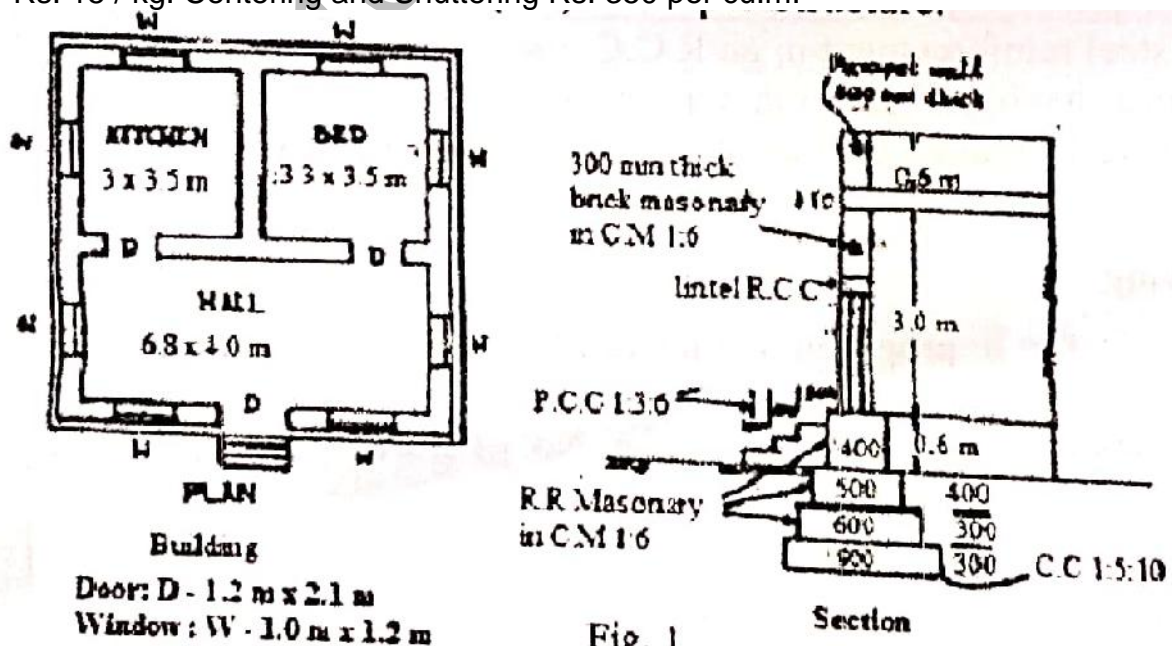
15 Prepare the detailed estimate of a septic tank for 25 users. (10)

16 Compute the quantity of steel reinforcement in an R.C.C. roof beam of 3.6 m clear span, the wall supporting are 230mm with full bearing on both sides size of the beam is 230x300mm concrete cover at end of bar and sides 40mm.

- 1) Main straight bars at bottom -12mm dia -2 nos
- 2) Main bent at bottom - 12mm dia -2 nos
- 3) Top anchor bars - 12mm dia -2 nos
- 4) Stirrups are 6mm dia at both 1m long excluding bearing on either side at 150mmc/c and middle 1.6mlength at 210mmc/c. (10)

17 Compute the unit rate for 1 : 4 : 8 with over burnt brick for 7.5 cm thick cement flooring. The labour requirement per cum is Head Mason 1/2no, Masons 10 nos and mazdoors 20 nos and the corresponding rate are Rs.450/-, Rs.400/-, Rs.350/- respectively. The cost of cement bag is Rs.350/- brick chips 20mm down Rs.2000/- per cum and sand Rs.1200/-cum Bar building.

Rs. 15 / kg. Centering and Shuttering Rs. 350 per cu.m. (10)



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**FACULTY OF ENGINEERING****B.E. 4/4 (Civil) II-Semester (Main& Backlog) Examination, May /June 2019****Subject: Construction Management & Administration****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 Explain scheduling and controlling as a function of construction management? (3)
- 2 What do you mean by a dummy activity? Why it is used in networking? (3)
- 3 What is Work Breakdown Structure (WBS)? What is its significance? (3)
- 4 What do you mean by slack? Define variance and standard deviation (3)
- 5 What are the advantages of item rate contract. (3)
- 6 State different types of organizational structure? (2)
- 7 Mention feature of contract labour act. (2)
- 8 Explain the use of security money. (2)
- 9 What are the different project delivery methods? (2)
- 10 What is an unbounded solution (2)

**PART – B (50 Marks)**

- 11 Discuss briefly the principles of organization. With the help of neat sketch explain Line and Staff Organizational Form. Give its relative advantages and disadvantages. (10)
- 12 Given is the following information regarding a project? (10)

Activity	A	B	C	D	E	F	G	H	I	J	K	L
Dependence	-	-	-	AB	B	B	FC	B	EH	EH	CDFJ	K
Duration(days)	3	4	2	5	1	3	6	4	4	2	1	5

Draw the Network Diagram and identify the Critical Path and Project Duration.

Find the three types of floats (viz. Total, Free and Independent) for each activity.

- 13 Determine the optimum cost and duration of a building project. The relevant data is in the following table. Indirect cost is Rs 10,000 per day. (10)

Activity	Normal Time (Days)	Normal Cost (Rs)	Crash Time (days)	Crash Cost (Rs)
1-2	2	30,000	1	32,000
1-3	8	40,000	6	46,000
1-4	10	50,000	5	75,000
2-5	5	10,000	3	15,000
3-5	7	25,000	6	26,000
4-6	15	70,000	10	1,00,000
5-6	6	15,000	4	23,000

Contd...2

- 14 (a) What are the essential features of a construction contract? (4+6)  
(b) What are tender documents? Discuss briefly the contents of typical tender documents.
- 15) Write a short note on the following  
a) Differentiate between critical path and non critical path  
b) Discuss the Fulkerson rule of numbering events  
c) Explain about forward pass and backward pass for identifying the critical path (10)
- 16) Use the Simplex method to solve the following LP problem  
Minimize :  $Z = 30x_1 + 20x_2$   
Subject to constraints :  
 $-x_1 - x_2 \geq -8$   
 $-6x_1 - 4x_2 \leq -12$   
 $5x_1 + 8x_2 = 20$   
 $x_1, x_2 \geq 0$  (10)
- 17) Write a short note on the following:  
a) Graphical method  
b) Scalar principle  
c) Limitation of Linear programming (10)

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**FACULTY OF ENGINEERING****BE 4/4 (EEE/Inst.) II – Semester Examination, May 2019****Subject: Industrial Administration and Financial Management****Time: 3 Hours****Max. Marks: 75****Note: Answer all question From PART – A, & any Five question from PART – B****PART – A (10 x 2 ½ = 25 Marks)**

1. Define the term Management and state its functions.
2. List out the merits and demerits of Product layout.
3. List out the types of ratings used in time study and describe any one of them.
4. Define the term 'Work Study'.
5. State the types & objectives of Inspection.
6. What is importance of 'Quality Circles'?
7. Differentiate between CPM and PERT.
8. State the objectives of Materials Management.
9. State the assumptions in break-even analysis.
10. What are the elements of costs?

**PART – B (50 Marks)**

11. Discuss the principle factors in selecting a location for an Industry, citing suitable example.
12. (a) State the principles of Motion Economy related Human body.  
(b) Explain briefly wage payment plan.
13. (a) Explain how control charts are helpful to the process industry and state various control limits for both variables and attributes.  
(b) Distinguish between types of Production.
14. Four machines namely A, B, C, and D are to be repaired by four maintenance operator who can perform all the jobs but differ in their efficiency and the task differ in their intrinsic difficulty. The estimates of the times each man would take to perform each are given below in the matrix.

<b>Machine Operator</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
<b>P</b>	8	24	17	11
<b>Q</b>	13	28	4	26
<b>R</b>	38	19	18	15
<b>S</b>	19	26	24	10

How the repair task should be allocated to the operator to minimize the total man hours?

**Contd..2**

15. (a) Derive the formula for simple EOQ and state its assumptions.  
(b) Explain Halsey plan of wage incentive.
16. (a) A machine is brought for Rs 1, 00,000/- and is estimated to have a life of 8 years and scrap value of Rs 20, 000/- at the end of life. Calculate
- Annual depreciation rate.
  - Total depreciation up to the end of 5 years.
  - Book value at the end of 5 years. Assume interest rate of 5%. Use straight line method for calculating depreciation.
- (b) Explain the concept of Break Even Analysis and state its importance.
17. Write short notes on the following.
- Capital budgeting.
  - Organization Structure and their merits and demerits.
  - Principles of PPC and its functions.
  - Financial leverage.

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**FACULTY OF ENGINEERING****BE 4/4 (ECE) II Semester (New) (Main & Backlog) Examination, May/June 2019****Subject: Data Communication & Computer Networks****Time: 3 Hrs****Max Marks:75****Note: Answer all questions from Part –A, & any Five questions from Part-B.****PART – A( 25 Marks)**

1. Compare and contrast Bus, Star, Ring and Hybrid true configurations. 3
2. Explain how different is the spanning tree algorithm from source routing algorithm. 2
3. Distinguish between Bridges and Routers. 3
4. Draw the frame format of IEEE 802.3 standard. 2
5. Explain the function of routing table. 2
6. Explain how different is congestion control from flow control. 3
7. Briefly explain the architecture of an ATM network. 3
8. List out the elements of Transport protocol. 2
9. Compare SNMP and SMTP protocols. 2
10. Define the three important aspects of security. 3

**PART – B (50 Marks)**

11. a) Describe the ISO-OSI Model 5
- b) Explain routing in circuit switched and packet switched networks. 5
12. a) Explain the ARQ protocols. 7
- b) Compare ALOHA and Slotted ALOHA. 3
13. a) Explain any two routing algorithms with necessary diagram and examples. 7
- b) Draw and explain the frame format of IPV6. 3
14. a) Describe TCP protocol and explain all the fields in the TCP header. 6
- b) Draw and explain the UDP header. 4
15. a) Describe authentication protocols in detail. 5
- b) Explain the architecture of E-mail. 5
16. Mention the two categories of cryptography methods and explain each one of them with examples. List out the differences between the two cryptography methods. 10
17. Write short notes on any two:
  - a) HDLC frame format.
  - b) Medium Access Control.
  - c) Wireless LANs. 10

**FACULTY OF ENGINEERING**  
**B.E.4/4 (ECE) II – Semester (Old) Examination, May/June 2019**

**Subject: Radar and Satellite Communication**

**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 Radar? What are the various applications of Radar? (3)
2. Explain the frequency bands allocation for Satellite services. (3)
3. Draw the block diagram of CW Doppler radar. (2)
4. What is meant by multiple access? (2)
5. Explain the principle of operation of MTI radar. (3)
6. Define the terms Apogee & Perigee? (2)
7. Explain how AGC is achieved in conical scan? (3)
8. What is Satellite packet switching? (2)
9. Write short notes on matched filter. (2)
10. Describe the spread spectrum transmission & reception of CDMA? (3)

**PART – B (50 Marks)**

11. (a) Explain the working of Radar with the help of a block diagram and hence bring out the role of transmitter & receiver in Radar. (6)
- (b) Explain at least five applications of Radar in detail? (4)
- 12 (a) Derive the relation between saturation flux density and carrier to noise ratio. (5)
- (b) What is Link Budget? Explain Uplink Budget of a Satellite with neat diagram? (5)
13. (a) Explain the Butterfly effect that is produced by MTI. (5)
- (b) Draw the block diagram of non-coherent MTI Radar and explain the function of each block in detail. (5)
14. (a) Explain TDMA frame structure. (4)
- (b) What are the different types of demand assignment multiple access characteristics? (4)
15. (a) Explain the block diagram of amplitude comparison mono pulse radar for extraction of error signals in both elevation and azimuth. (6)
- (b) What are the advantages of mono pulse radar over conical scan radar? (4)
16. Write notes on (a) EIRP (b) Carrier to Noise Density Ratio (c) Energy bit to noise density ratio (d) G/T ratio (10)
17. (a) Define Packet and explain in detail about Packet Reservation ? (5)
- (b) Discuss message transmission by TDMA. (5)

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**FACULTY OF ENGINEERING****BE 4 / 4 (Mech. /Prod.) II – Semester (Main & Backlog) Examination, May/June 2019****Subject: Production and Operations Management****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from Part – A, & any five questions from Part – B****PART – A (10 x 2 ½ = 25 Marks)**

1. What is meant by Incentive? Enlist any two types of Incentive plans.
2. Define the term Plant Layout and give its objectives.
3. What are the advantages of Forecasting?
4. State about dependent and independent demand.
5. What are the measures to be taken for a good Master Production Schedule (MPS) design?
6. What are the benefits of material requirement planning?
7. Define term Inventory. State reorder point.
8. Write about fixed order quantity system.
9. Distinguish between 'Activity' and 'Event'.
10. Why CPM is called deterministic model and PERT as probabilistic model?

**PART - B (50 Marks)**

11. Discuss the principle factors in selecting a location for an Industry, citing suitable example-comment.
12. What is mean by Exponential smoothing? Alaric Industries Ltd. has experienced the following demand for its "Personal Finance" software package.

Month	April	May	June	July	August	September	October	November
Period	1	2	3	4	5	6	7	8
Units	56	61	55	70	66	65	72	75

Develop an exponential smoothing forecast using  $\alpha=0.4$  and an adjusted exponential smoothing using  $\alpha=0.4$  and  $\beta=0.2$

13. (a) Explain the Deterministic and Stochastic inventory model.
  - (b) Alaric Industries Ltd. Uses 10,000 units per year of an item. The purchase price is Rs. 1/- per item. Ordering cost is Rs25/- per order. Carrying cost per year is 12% of the inventory value.
    - i) The EOQ
    - ii) The number of orders per year.

**Contd...2**

iii) If the lead time is 4 (four) weeks and assuming 50 (fifty) working weeks per year, find the reorder point.

14. What do you mean by Master Production Schedule (MPS) plan? What are the measures to be taken for a good master production schedule design? Explain the objectives and functions of MPS.

15. (a) Explain the various techniques of wage payment plans.

(b) Explain the methodology of forecasting by least square.

16. A small marketing project consists of the jobs in the table given below. With each job listed its normal time and a minimum of crash time (in days) and the cost (Rs. per day) of crashing each job are also given.

Job	Normal duration (days)	Min. (Crash) duration (days)	Cost of Crashing (Rs. Per day)
1 - 2	9	6	20
1 - 3	8	5	25
1 - 4	15	10	30
2 - 4	5	3	10
3 - 4	10	6	15
4 - 5	2	1	40

1) What is the normal project length and min. project length?

2) Determine the minimum crashing costs of schedules ranging from normal length down to, and including, the minimum length schedule, find the costs of schedules which are L, L1, L2 and so on days long. Overhead costs total Rs. 60/- per day. What is the optimum length schedule duration on each job for optimum solution?

17. Write short notes on the following.

i) Cost in Aggregate Planning

ii) Fixed Order Quantity System

iii) Fulkerson's Rule

iv) Method Study

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**FACULTY OF ENGINEERING****B.E. 4/4 (AE) II - Semester (Main & Backlog) Examination, May / June 2019****Subject : Quality Control and Reliability Engineering****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 SQC.
- 2 Explain Attribute charts features.
- 3 Explain process capability.
- 4 List Quality costs.
- 5 Define AQL, LTPD.
- 6 Define Reliability.
- 7 Explain product life cycle with neat sketch.
- 8 Define AOQL.
- 9 Explain system reliability in Series and Parallel system.
- 10 Define Hazard rate.

**PART – B (50 Marks)**

- 11 (a) Explain purpose and advantages of control charts. (4)
- (b) Construct an "X bar" and "R" chart given the following data. Given, sample size = 5. Plot the values and draw the conclusions?  
(Note : for,  $n = 5$ , take  $A_2 = 0.58$ ,  $D_3 = 0$ ,  $D_4 = 2.11$ ) (6)

Sample No:	1	2	3	4	5
Sample Mean	10.5	11	10.3	9.75	10
Sample Range	1.5	2	1.3	0.75	1

- 12 (a) Explain Double Sampling plan. (4)
- (b) For  $n = 25$  and  $c = 2$  construct a OC curve and find the producer's risk at AQL of 4%? (6)
- 13 Explain in detail "Operation Characteristics curve". (10)
- 14 (a) Explain Availability. (3)
- (b) It is given that the Robot, Turning, Milling, and Grinding operations are performed one after the other i.e. all are on series. Reliability of components is 0.99, 0.98, 0.99, 0.96 respectively. (7)
  - (i) Calculate the system reliability
  - (ii) If two Grinders (parallel to each other) are available then calculate the system reliability?
- 15 (a) List the Reliability improvement techniques. (4)
- (b) Explain Information flow during product analysis. (6)
- 16 Explain Comments concerning  $C_p$  and  $C_{pk}$  with neat sketches. (10)
- 17 Write short notes on the following:
  - (a) Redundancy (4)
  - (b) Maintenance (3)
  - (c) Burn – in (3)

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**FACULTY OF ENGINEERING****B.E. 4/4 (CSE) II – Semester (Main & Backlog) Examination, May 2019****Subject: Data mining****Time: 3 Hours****Max. Marks: 75****Note : Answer all questions from Part – A & any five questions from Part – B.****PART – A (25 Marks)**

1. Describe three challenges to data mining regarding data mining methodology. [2]
2. Given two objects represented by the tuples (22, 1, 42, 10) and (20, 0, 36, 8). Compute the supermum distance and Minkowski distance between the two objects, using  $q = 3$ ? [2]
3. Compare Discovery-driven cube with multi feature cube with an example? [3]
4. Outline a three-tier data warehousing architecture? [3]
5. Prove that the support of any nonempty subset  $S_1$  of item set  $S$  must be at least as great as the support of  $S$ ? [3]
6. Give an example to show that items in a strong association rule actually may be Negatively correlated? [2]
7. Why is Naïve Bayesian classification called “native”? [2]
8. What is boosting? State why it may improve the accuracy of decision tree induction? [3]
9. What is clustering? Outline the requirements of clustering in data mining? [2]
10. Summarize the applications of Data Mining for Retail and Telecommunication Industries? [3]

**PART – B (50 Marks)**

11. (a) Describe various methods for handling tuples with missing values for some attributes? [6]  
(b) Use a flowchart to summarize stepwise forward selection, stepwise backward elimination and combination of forward selection and backward elimination? [4]
12. In data ware house technology. A multiple dimensional view can be implemented by ROLAP, MOLAP and HOLAP. For each technique, explain how each of the following functions may be implemented. [10]  
(i) The generation of a data ware house (ii) Roll-up  
(iii) Drill-down (iv) Incremental updating
13. A database has five transactions. Let min support = 60% and min confidence = 80%. [10]

TID	Items bought
T100	{M,O,N,K,E,Y}
T200	{D,O,N,K,E,Y}
T300	{M,A, K, E}
T400	{M,U,C,K,Y}
T500	{C,O,O,K,I,E}

Find all frequent item sets using Apriori and FP-growth, respectively. Compare the efficiency of the two mining processes?

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14. Take any suitable database with 8 tuples. Describe the working of decision tree classifier using ID3 algorithm. What is the role of Information Entropy and Information Gain? [10]
15. Explain Back propagation algorithm with an suitable example? [10]
16. Explain Partitioning around Medoids (PAM) algorithm. What is the necessity of PAM algorithm over k-means algorithm? [10]
17. Discuss the various challenges and trends in data mining? [10]

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**FACULTY OF ENGINEERING****B.E. 4/4 (I.T.) II – Semester (New)(Main & Backlog) Examination, May/June 2019****Subject : EMBEDDED SYSTEMS****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) Define microprocessor, microcontroller and Embedded System (3M)
- 2) Draw the structure of PSW (2M)
- 3) Differentiate between SJMP, AJMP and LJMP instructions of 8051 (3M)
- 4) Differentiate between MOVX and MOVC instructions (2M)
- 5) What is a semaphore? Differentiate between counting semaphore and binary semaphore. (3M)
- 6) What are differences between native linker and locator? (2M)
- 7) What is debugging? Write the goals of testing process? (3M)
- 8) List out the laboratory tools that are used in Embedded System. (2M)
- 9) What are the functions of parallelism in I<sup>2</sup>C bus? (2M)
- 10) List out three real-time examples for ARM processor. (3M)

**PART – B (50 Marks)**

11. a) Explain the levels of abstraction in Embedded system design process. (5M)  
b) Compare and Contrast top-down and bottom-up design. (5M)
12. a) Explain data transfer and logical instructions of 8051 microcontroller. (6M)  
b) Write an ALP to count number of odd numbers stored in series of data. (4M)
13. a) Explain how a 4-digit 7-segment display is interfaced to 8051 microcontroller with a suitable example. (6M)  
b) Discuss the interrupt routines in an RTOS environment. (4M)
14. a) Describe the hard real time scheduling considerations. (5M)  
b) Explain the interrupt routines handled procedures in RTOS. (5M)
15. a) Explain I<sup>2</sup>C bus protocol with neat diagram. (5M)  
b) Compare and contrast Von-Neumann and Harvard architectures. (5M)
16. a) Explain counters in 8051 microcontroller. (5M)  
b) Explain how memory is managed in an RTOS environment? (5M)
- 17) Write short notes on any two of the following:
  - a) Input and output ports and circuits of 8051 microcontroller. (5M)
  - b) Testing on host machine. (5M)
  - c) Instructions to handle interrupt of 8051 microcontroller. (5M)

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**FACULTY OF ENGINEERING****B.E. 4/4 II – Semester (Old) Examination, May/June 2019****Subject: 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. List the characteristics of embedded systems. (2)
2. Draw and explain the structure of PSW. (3)
3. Differentiate between MOVX and MOVC. (2)
4. Discuss all the arithmetic flags used by 8051. (3)
5. Explain network configurations used for serial communication. (3)
6. State priority inversion problem. (3)
7. Define cross assembler and cross compiler. (2)
8. List various laboratory tools used for debugging embedded system. (2)
9. Distinguish I<sup>2</sup>C and CAN bus. (2)
10. What is shared data problem and how it can be solved? (3)

**PART – B (10 x 5 = 50 Marks)**

11. a) Draw and explain block diagram of embedded system. (5)  
 b) Explain memory organization of 8051 microcontroller. (5)
12. a) Explain various SFR's used by timers/counters. (5)  
 b) Describe various timer modes of operation in 8051. (5)
13. a) Explain different addressing modes. (5)  
 b) Explain PUSH and POP operations using a sample program. (5)
14. Explain how LCD is interfaced to 8051 with a suitable diagram. (10)
15. a) Discuss hard real time scheduling considerations. (5)  
 b) Discuss various ways to get embedded software into target system. (5)
16. a) Discuss basic ARM programming model. (5)  
 b) Describe various types of instructions supported by ARM processor. (5)
17. Write short notes on any two of the following
  - (a) Jump and call instructions. (5)
  - (b) Task and task state diagram. (5)
  - (c) Types of interrupts. (5)

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**FACULTY OF ENGINEERING****B.E. V – Semester (CBCS)(supple.) (Civil)(Supple.) Examination May / June 2019****Subject: Reinforced Cement Concrete****Time: 3 Hours****Max. Marks: 70****Note: i) Answer all questions from Part A and any five questions from Part B.****ii) Missing data if, may be suitably assumed.****Part – A (20 Marks)**

1. Give the need for the test on steel.
2. Draw the stress strain curve for concrete and explain.
3. Why flexural and shear failures occur in the beam, give reasons.
4. Define anchorage.
5. How do you check for serviceability design?
6. Give the IS specifications required for shear design.
7. Explain the acceptability criteria for deflections.
8. Define one way slab.
9. Explain any two advantages of limit state design.
10. Give IS specifications for the design of footings and columns.

**Part – B (50 Marks)**

11. a) Explain the limitations of working stress method and limit state method. 5M  
b) Explain basic requirements of RCC structures. 5M
12. Design a reinforced concrete beam subjected to a bending moment of 30kNm. Use M25 grade concrete and fe500 grade steel. The width of the beam equal to the half of the effective depth. Permissible stress in concrete is  $8\text{N/mm}^2$ , permissible stress in steel is  $250\text{ N/mm}^2$ ,  $m = 13$ , Use working stress method. 10M
13. Design a rectangular beam of 8m effective span which is subjected to dead load of 12kN/m and live load of 15kN/m. Use M25 grade concrete and fe550 grade steel. 10M
14. Design a ring beam section 60 mm wide and 800 mm deep subjected to a bending moment of 150kNm and twisting moment of 15 KN m a shear force of 150kNm at ultimate. Use M25 grade concrete and fe550 grade steel. 10M
15. Design a slab for a room 6.5mx7.5m clear in size to support a superimposed service load of  $6\text{kN/m}^2$  if two of its adjacent edges are continuous and other two are discontinuous. Assume if any data required. 10M

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16. Design a square column 6m long to carry a load of 300kN if its size is restricted to 380 mm. both ends of the columns are hinged. Use helical reinforcement. 10M
17. Design a footing for a 550mm square column reinforced with 8-25 mm dia fe550 grade bars and M25 grade concrete, one side of the footing is restricted to 1.5m the gross bearing capacity of the soil is 120 kN/m<sup>2</sup>. Assume concrete as M25 and grade of steel as f3500. 10M

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**FACULTY OF ENGINEERING**

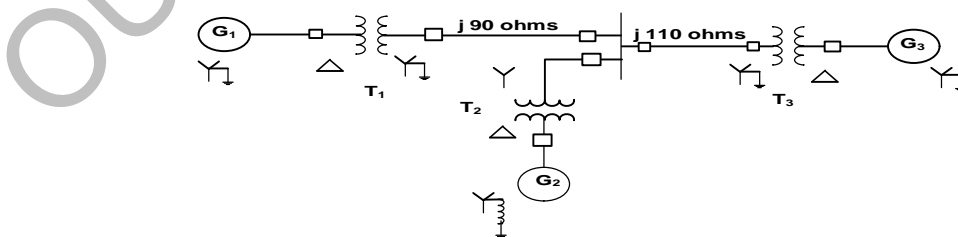
B.E (EEE) V-Semester(CBCS)(Suppl.) Examination, May / June 2019

**Subject : Power Systems - II****Time: 3 Hours****Max. Marks: 70****Note :** Answer all questions from part – A and any five questions from Part-B**PART– A (10 x 2 = 20 Marks)**

1. Obtain the exact condition for zero regulation for a short transmission lines. 2 M
2. What is fictitious radius? Brief it. 2 M
3. What do you understand by generalised circuit constants of a transmission line ?  
What is their importance? 2M
4. The generator emf is 1 p.u and the subtransient reactance is 25%. Find the subtransient current. 2 M
5. Draw the connections of sequence networks for three phase to ground fault through an impedance  $Z_r$  2 M
6. Explain the harmful effects of short-circuit fault on the power system. 2 M
7. Draw the vector diagram with the help of sequence components to obtain the phase voltages. 2 M
8. Explain the reasons for not redistribution of currents and voltages instantaneously in a power system switching's. 2 M
9. What is the importance of Voltage Control in power systems? 2 M
10. Brief about arcing ground. 2 M

**PART– B (50 Marks)**

11. Using rigorous method, derive expressions for sending end voltage and current for a long transmission line. 10 M
12. The single line diagram of an unloaded power system is shown in below fig. The generator and transformers are rated as follows: 10M  
 $G_1 = 22\text{MVA}, 13.8\text{ kV}, X'' = 20\%$ ,  $G_2 = 30\text{ MVA}, 18\text{ kV}, X'' = 20\%$ ,  
 $G_3 = 33\text{MVA}, 20\text{ kV}, X'' = 20\%$ ,  $T_1 = 25\text{MVA}, 220/13.8\text{ kV}, X = 10\%$ ,  
 $T_2 = 3\text{ single phase units each rated at } 10\text{MVA}, 127/18\text{ kV}, X = 10\%$ ,  
 $T_3 = 35\text{MVA}, 220/22\text{ kV}, X = 10\%$ . Draw the reactance diagram using a base value of 50MVA and 13.8 kV on the generator  $G_1$ .

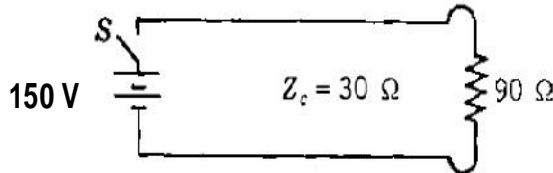


13. From fundamentals along with the necessary diagrams obtain the expressions for fault currents for a unloaded synchronous generator for the following types of faults. (assume the neutral is grounded through an impedance  $Z_n$ .) 10M
  - i) Double line to ground
  - ii) L-L-G fault 10 M

14. Along with its advantages and disadvantages explain the following (with necessary diagrams):

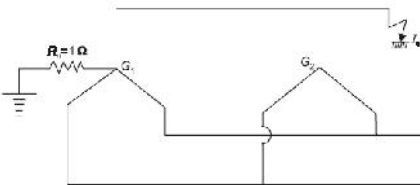
- a) Static Var compensator 5M  
 b) Thyristor controlled reactor 5M

15. a) A dc source of 120 V with negligible resistance is connected through switch S to a lossless transmission line having  $Z_c = 30$  ohms. The line is terminated in a resistance of 90 ohms. If the switch closes at  $t = 0$ , plot  $V_R$  versus time until  $t = 5T$ , where  $T$  is the time for a voltage wave to travel through the length of the line. 6 M



- b) Derive the expression for reflection and refraction coefficients. 4 M

16. Two 11 kV, 12 MVA, 3-phase star connected generators operate in parallel as shown below. The positive, negative and zero reactance's of each being  $j0.08$ ,  $j0.06$  and  $j0.045$  pu respectively. A single line to ground fault occurs at the terminals of one of the generators. Calculate i) Fault current. ii) Voltage across the grounding resistor. 10 M



17. a) Explain about voltage control by using tap changing transformer. 4 M

- b) A 3-phase, 50Hz, 150 km line has a resistance, inductive reactance and capacitive shunt admittance of  $0.1$  ,  $0.5$  and  $3 \times 10^{-6}$  S per km per phase. If the line delivers 50 MW at 110 kV and 0.8 p.f. lagging, determine the sending end voltage and current. Assume a nominal  $\pi$  circuit for the line. 6 M

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**FACULTY OF ENGINEERING****B.E. (EIE) V - Semester (CBCS) (Suppl.) Examination, May / June 2019****Subject : Power Plant Instrumentation****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 meant by steam circuits?  | 2m |
| 2  | Explain the importance of I & C in TPP  | 2m |
| 3  | Explain the basic principle of Rankine cycle.                                   | 2m |
| 4  | What are the basic control loops in steam boiler instrumentation?               | 2m |
| 5  | Draw the process diagram of steam temperature control.                          | 2m |
| 6  | What are the types of Glands for controlling exhaust Pressure in steam turbine? | 2m |
| 7  | What is a combined cycle power plant?   | 2m |
| 8  | How many types of condensate systems are present in TPP?                        | 2m |
| 9  | What is water hammering in Hydel power plant?                                   | 2m |
| 10 | Draw the correct position of economizer in feed water control.                  | 2m |

**PART – B (50 Marks)**

- |    |   |     |
|----|---|-----|
| 11 | (a) With a neat diagram explain the boiler following mode.  | 7m  |
|    | (b) Write briefly about pressure distribution curve in drought control.   | 3m  |
| 12 | With a neat diagram explain power generation using Nuclear power plant and write importance of control rods.                  | 10m |
| 13 | With neat diagrams explain the steam temperature control.   | 10m |
| 14 | With a neat diagram explain Hydrogen generator cooling system in Turbine control.   | 10m |
| 15 | (a) With a neat block diagram explain TSI (Turbine supervisory instrumentation).  | 5m  |
|    | (b) Discuss about lubrication oil temperature control in turbines.  | 5m  |
| 16 | Explain the transducers used for metal temperature measurement in boilers. Also discuss about importance of flame monitoring. | 10m |
| 17 | Write short notes on:   |     |
|    | (1) P & I diagram of boiler   | 6m  |
|    | (2) 3 element Boiler drum level control system  | 4m  |

**FACULTY OF ENGINEERING****BE V Semester (CBCS) (ECE)(Supple.) Examinations, May/June 2019****Subject: Linear ICs and Applications****Time: 3 Hours.****Max. Marks: 70****Note: Answer all question from Part – A, & answer any 5 questions from Part – B****PART – A (10 x 2 = 20 Marks)**

1. Explain the terms balanced output and unbalanced output?
2. List the ideal characteristics of an Op-Amp?
3. Draw the circuit of a log amplifier using Op-Amp?
4. Compare inverting and non-inverting amplifiers?
5. Explain how an op-amp can be used as comparator?
6. How precision rectifiers differ from conventional rectifier?
7. Mention any four applications of IC 555 timer?
8. Draw pin diagram of Voltage Controlled Oscillator (VCO) IC 566?
9. List the characteristics of three terminal voltage regulators?
10. Define resolution of an n bit DAC and find resolution of 12 bit DAC when output varies from 0 to 10v?

**PART – B (5 x 10 = 50 Marks)**

11. a) Define frequency compensation? Explain any two external compensation techniques (5)  
b) Define following parameters as applied to an Op-amp (5)
12. a) Draw and explain the commonly used three op-amp instrumentation amplifier circuit? Derive the expression for its gain? (5)  
b) Explain the voltage to current converter if the load is i) floating and ii) grounded. (5)
13. a) Explain the positive clipper with negative reference and negative clipper with positive reference? (5)  
b) Design a band pass filter  $f_L = 2\text{KHz}$  and gain  $A_o = 10$ . Choose  $C = 1 \sim \text{F}$ . (5)
14. a) List the applications of PLL and explain any two in detail? (5)  
b) Using Op-Amp design a Triangular wave form generator and explain its operation? Derive the expression for its frequency? (5)
15. a) With the help of neat circuit, explain the operation of Dual Slope ADC? (6)  
b) Design an adjustable regulator from the 7805 IC regulator to get an output voltage 9v (Assume  $I_Q = 4.2\text{mA}$ ) (4)
16. a) Explain the operation of sample and hold circuit using op amp with neat circuit? (5)  
b) Derive the output expression for an inverting type summing amplifier along with the circuit diagram? (5)
17. a) Design a square wave generator using IC 555 timer for a 1.5 KHz and Duty cycle of i) 60% and ii) 50% ? (4)  
b) Derive the expression for a Differential gain and common mode gain of a Dual input balanced output differential amplifier? (6)

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**FACULTY OF ENGINEERING**  
**B.E V-Semester (CBCS) (M /P/AE)(Suppl.) Examination, May/June 2019**

**Subject: Dynamics of Machines**

**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 will be the effect of the gyroscopic couple on a disc fixed at a certain angle to a rotating shaft?
2. Define 'inertia force' and 'inertia torque'.
3. Sketch the turning moment diagram of a four stroke cycle internal combustion engine.
4. Define the terms 'coefficient of fluctuation of energy' and 'coefficient of fluctuation of speed'.
5. State role of reference plane in balancing masses of rotation in different planes.
6. State on primary and secondary balancing.
7. State the term 'Logarithmic decrement' as applied to damped vibrations
8. What do you understand by transmissibility?
9. Define the term 'node' and explain how it is obtained.
10. Find the ratio of amplitudes of rotors of torsional vibrations of a two-rotor system.

**Part-B [5x10=50]**

11. During a trial on steam engine, it is found that the acceleration of the piston is  $36 \text{ m/s}^2$  when the crank has moved  $30^\circ$  from the inner dead centre position. The net effective steam pressure on the piston is  $0.5 \text{ N/mm}^2$  and the frictional resistance is equivalent to a force of 600 N. The diameter of the piston is 300 mm and the mass of the reciprocating parts is 180 kg. If the length of the crank is 300 mm and the ratio of the connecting rod length to the crank length is 4.5, find : (a) Reaction on the guide bars, (b) Thrust on the crank shaft bearings, and (c) Turning moment on the crank shaft.
12. In a spring loaded governor of the Hartnell type, the mass of each ball is 5 kg and the lift of the sleeve is 50 mm. The speed at which the governor begins to float is 240 r.p.m., and at this speed the radius of the ball path is 110 mm. The mean working speed of the governor is 20 times the range of speed when friction is neglected. If the lengths of ball and roller arm of the bell crank lever are 120 mm and 100 mm respectively and if the distance between the centre of pivot of bell crank lever and axis of governor spindle is 140 mm, determine the initial compression of the spring taking into account the obliquity of arms. If friction is equivalent to a force of 30 N at the sleeve, find the total alteration in speed before the sleeve begins to move from mid-position.

13. The cranks and connecting rods of a 4-cylinder in-line engine running at 1800 r.p.m. are 60 mm and 240 mm each respectively and the cylinders are spaced 150 mm apart. If the cylinders are numbered 1 to 4 in sequence from one end, the cranks appear at intervals of  $90^\circ$  in an end view in the order 1-4-2-3. The reciprocating mass corresponding to each cylinder is 1.5 kg. Determine: (a) Unbalanced primary and secondary forces, if any, and (b) Unbalanced primary and secondary couples with reference to central plane of the engine.
14. Calculate the whirling speed of a shaft 20 mm diameter and 0.6 m long carrying a mass of 1 kg at its mid-point. The density of the shaft material is  $40 \text{ Mg/m}^3$ , and Young's modulus is  $200 \text{ GN/m}^2$ . Assume the shaft to be freely supported
15. The measurements on a mechanical vibrating system show that it has a mass of 8 kg and that the springs can be combined to give an equivalent spring of stiffness 5.4 N/mm. If the vibrating system have a dashpot attached which exerts a force of 40 N when the mass has a velocity of 1 m/s, find: (a) critical damping coefficient, (b) Damping factor, (c) Logarithmic decrement, and (c) ratio of two consecutive amplitudes.
16. Three rotors A, B and C having moment of inertia of 2000, 6000 and 3500  $\text{kg-m}^2$  respectively are carried on a uniform shaft of 0.35 m diameter. The length of the shaft between the rotors A and B is 6 m and between B and C is 32 m. Find the natural frequency of the torsional vibrations. The modulus of rigidity for the shaft material is  $80 \text{ GN/m}^2$ .
- 17(a) Derive an expression for equivalent length of torsionally equivalent shaft with four steps (diameters).  
(b) A flywheel having a mass of 30 kg and a radius of gyration of 350 mm is given by a spin of 600 rpm about its axis which is horizontal. The flywheel is suspended at a point that is 300 mm from the plane of rotation of the flywheel. Find the rate of the precession of the flywheel.

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## FACULTY OF ENGINEERING

B.E. V – Semester (CBCS) (CSE)(Supple.) Examination, May/June 2019

Subject: Database Management Systems

Time: 3 hours

Max. Marks: 70

**Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****Part – A (2x10=20 Marks)**

- 1) What is the need of data model in DBMS and give its classification
- 2) Write about data mining analysis.
- 3) What is a surrogate key? How can it be used for schema refinement?
- 4) What is a phantom record? Why do they occur?
- 5) Explain object-oriented data model.
- 6) Explain about JDBC.
- 7) Write about multiple granularity.
- 8) What is ARIES?
- 9) What is fuzzy check point?
- 10) Explain about Log based recovery

**Part – B (5x10=50 Marks)**

- 11 a) Describe about object based databases. (5M)
- b) Explain the concept of design issues in E-R model with suitable examples. (5M)
- 12 a) Consider the following schema:  
Suppliers (sid, sname, address)  
Parts (pid, pname, color)  
Catalog (sid, pid, cost)  
Write the relational algebraic queries for the following:  
i) Find the sids of suppliers who supply some red or green part  
ii) Find the sids of suppliers who supply every red or green part  
iii) Find the pids of parts supplied by at least two different suppliers. (6M)
- b) Explain about Nested sub queries with example (4M)
- 13 a) Explain about decomposition using functional dependencies (7M)
- b) Differentiate Between 3NF and BCNF. (3M)
- 14 Compare static and dynamic hashing Show the extendable hash structure for the search key values 2,3,5,7,11,17,19,23,29,31 where  $h(x)=x \text{ mod } 8$  and buckets can hold 3 records. (10M)
- 15 a) Explain briefly about deadlock handling. (5M)
- b) Explain about Multi key access. (5M)
- 16 a) Write about weak levels of consistency with example. (5M)
- b) Explain about restart recovery (5M)
17. Write short notes on  
a) Failure with loss of non volatile (4M)  
b) Bitmap indices (3M)  
c) Data dictionary (3M)

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**FACULTY OF ENGINEERING**

**BE V Semester (CBCS) (IT) (Supple.) Examination, May/June 2019**

**Subject: Software Engineering**

**Time: 3 Hours**

**Max. Marks: 70**

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

**Part – A (10x2=20Marks)**

1. Brief about CMM Process Patterns
2. List Hewlett Packard quality factors
3. Define functional independence and How can you assess functional independence
4. Define requirement engineering ?and list tasks in requirement engineering
5. Write short notes on pattern based software design
6. What is extensibility mechanism?
7. What are the rules of UML?
8. Define debugging and list various debugging techniques
9. List goals of SQA
10. Define software Reliability

**Part – B (5x10=50Marks)**

11. a) Explain about specialized Process models. (5+5)  
b) Define unified process and explain in detail
12. What is basic behavioral modeling and explain activity diagram ,swim lane diagram with an example (10)
13. a) Explain various architectural styles and Patterns. (5+5)  
b) Write short notes on flow oriented modeling
14. a) What is a component ?and explain component diagram in detail (5+5)  
b) Differentiate sequence diagram and collaboration diagram
15. a) Explain test strategies for o-o software. (5+5)  
b) Brief about Basis Path testing
16. a) Distinguish between black box and white box testing techniques (5+5)  
b) Write short notes on System Testing
17. Write short notes on a)Six sigma b)ISO 9000 standards (6+4)

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