FACULTY OF ENGINEERING
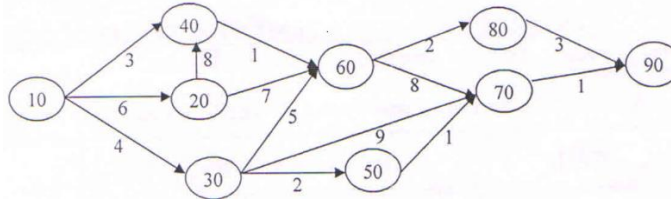
B.E. (Civil) VIII-Semester (CBCS) (Make-up) Examination, December 2020

Subject: Construction Management & Technology

Time : 2 hours   **Max. Marks : 70**

Note:(Missing data if, any can be assumed suitable)

PART – A

Answer any five questions.   **(5 x 2 = 10 Marks)**

1 State the necessity of construction management.
2 What are the important points about critical path method?
3 Define cost slope
4 Define normal estimate and crash estimate.
5 What do you understand Operation Research.
6 Discuss the application of operation research in construction.
7 Write the standard form of LPP for the following LPP:

   Maximize $Z = 3X_1 + 5X_2$

   Subject to $2X_1 + 3X_2 \leq 4$, $3X_1 + 2X_2 \geq 7$, $X_1, X_2 \geq 0$

8 What does the $C_j - Z_j$ row represent in a simplex tableau?
9 List out the causes of Accident on Construction Site.
10 List out the steps involved in demolition of building structures.

PART – B

Answer any four questions.   **(4 x 15 = 60 Marks)**

11 a) What are the various types of schedule for a heavy construction work. Explain briefly.
   b) State the advantages of CPM over the bar charts.

12 a) Explain in detail about direct project cost and indirect project cost.
   b) Explain the relationship between total cost and overall duration of a project.

13 Solve the following linear programming model Graphically?

   Maximize: $4X_1 + 4X_2$

   Subject to $-2X_1 + X_2 \leq 1$

                    $X_1 < 2$

                    $X_1 + X_2 \leq 3$

                    $X_1, X_2 \geq 0$

14 Solve the following linear programming problem by simplex method?

   Maximize: $Z = 3X_1 + 2X_2$

   Subject to $X_1 + X_2 \leq 4$

                       $X_1 - X_2 \leq 2$

                       $X_1 \geq X_2$

15 a) Explain causes of accidents on a construction site
   b) State codal requirements and explain the important safety measures to be followed in any demolition work.

                                                                                    …..2

16 Compute the earliest start time, earliest finish time, latest start time, latest finish time and total float for all activities of the given network. Also indicate the critical path in the network and determine the earliest project completion time.

17 Write short notes on :
   a) Differentiate between CPM and PERT
   b) Applications of operations research
   c) Define artificial variable and slack variable.
   d) Safety campaign.

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FACULTY OF ENGINEERING

B.E. (CBCS) (M/P) VIII - Semester (Make-up) Examination December 2020
Subject : Design of Solar Energy System (Elective-II)

Time : 2 Hours   Max. Marks: 70

Note:(Missing data if, any can be assumed suitable)

PART – A

Answer any five questions.   **(5 x 2 = 10 Marks)**

1. Define Solar Constant?
2. Define Irradiance?
3. Define Radiosity?
4. Define Utility Grid?
5. Define Photovoltaic Module?
6. Define F-Chart?
7. What is the temperature of Sun?
8. Name different types of solar water heater?
9. On what principal solar water heater works?
10. Distant software tools for design of solar thermar system.

PART – B

Answer any four questions.   **(4 x 15 = 60 Marks)**

11. a) Explain Grid Connected Photo-Voltaic System?.
    b) Explain Off-Grid Connected Photo – Voltaic System?

12. a) Explain Passive water hearting?
    b) Explain active water heating?

13. a) Explain Photo Voltaic Module?
    b) Explain the working principle of solar collector?

14. a) Explain the working of Solar Inventor?
    b) Explain Battery bank?.

15. a) Explain the major components of solar module?
    b) Explain the advantages of using solar energy?

16. a) Name different types of energy storage device?
    b) Explain thermal energy storage devices?.

17. a) What do you mean by solar energy device?
    b) Differentiate renewable and non renewable source of energy?

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B.E. (M/P) (CBCS) VIII – Semester (Make-up) Examination, December 2020

Subject: Composite Materials (E-II)

Time: 2 Hour   **Max. Marks: 70**

Note:(Missing data if, any can be assumed suitable)

PART – A

Answer any five questions.   **(5 x 2 = 10 Marks)**

1) State few advantages and limitation of composite materials.
2) What are the functions of matrix materials?
3) Define weight fraction and volume fraction of fiber in composite materials.
4) Find the longitudinal and Transverse elastic modulus of a unidirectional glass/epoxy lamina with a 70% fiber volume fraction. If E_f = 85 GPa, E_m = 3.4 GPa.
5) Distinguish between orthotropic and specially orthotropic elements.
6) For a composite Laminate what does matrixes [A], [B] and [D] represents?
7) Explain the different stages of fracture process in brief.
8) Name the different failure theories used in composite materials.
9) Draw basic element of composite cylindrical shell.
10) Write the equation of simple support rectangle plate under bending.

PART – B

Answer any four questions.   **(4 x 15 = 60 Marks)**

11. a) Explain about the Carbon-Carbon composite, properties and applications.
    b) Explain about the factors related to fiber matrix interface.

12. Derive the expressions to E_{11}, E_{22}, υ_{12}, and G_{12} in terms of constituent properties using micro-mechanics principles.

13. A composite material have the following material properties E_1=140 GPa, E_2= 12GPa, E_6=6Gpa and μ_{12}= 0.25. Determine the transfer reduced stiffness matrix for the lamina with ply angle 45^0.

14. a) Discuss the tensile behavior of unidirectional lamina with the help of stress strain diagram.
    b) With the help of neat sketch explain the various failure criteria of composites.

15. a) What are the assumptions in the thin plate laminate theory?
    b) In detail discuss the analysis of composite cylindrical shells under axially symmetric loads.

16. a) With neat sketch explain fabrication of Boron Fiber.
    b) Distinguish between micro and macro mechanics approach

17. a) Explain various features of cross ply laminate and angle ply laminate
    b) Discuss about the maximum strain theory used for designing of fiber reinforced composite

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FACULTY OF ENGINEERING
B.E. (M/P) VIII-Semester (CBCS) (Make-up) Examination, December 2020

Subject : Non-Destructive Testing (Elective – II)

Time : 2 Hours   **Max. Marks: 70**

Note: (Missing data if, any can be assumed suitable)
PART – A
Answer any five questions.   **(5 x 2 = 10 Marks)**

1. Compare destructive and non-destructive Testing.
2. Write the principle of Liquid Penetrate Inspection.
3. What is the principle of Eddy Current Testing?
4. List out the applications of Ultrasonic Testing.
5. State the principle of Radiography.
6. Write the basic principle of acoustic emission.
7. State the limitations of magnetic particle inspection.
8. Define sensitivity and calibration in ultrasonic testing.
9. How to produce X-rays in radiography?
10. Define thermography.

PART – B
Answer any four questions.   **(4 x 15 = 60 Marks)**

11 (a) Explain the Liquid Penetrate Inspection method. State its Advantages and Limitations.
   (b) Describe the Magnetic Particle Inspection method. State its advantages and limitations.

12 (a) Explain the Eddy Current Testing method. State its advantages and limitations.
   b) Define : (i) Lift- off factor(ii) Edge effect   (iii) Skin effect

13 (a) Discuss the Ultrasonic Testing of a material. State its advantages and limitations.
   (b) Discuss the cracks detection with eddy currents.

14 (a) With the schematic diagram explain the working principle of radiography.
   (b) Explain the principle of operation of fluoroscope.

15 (a) Discuss the acoustic emission inspection with the help of schematic diagram.
   (b) Explain the laser induced ultrasonic test system.

16 (a) List out the applications of
   (i) Liquid Penetrate Inspection.
   (ii) Magnetic Particle Inspection.
   (b) State the applications of Eddy Current Testing.

17 (a) Write about the neutron radiography.
   (b) Describe the surface texture analysis.
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B.E. (CBCS) (A.E) VIII - Semester (Make-up) Examination December 2020
Subject : Autotronics (Elective-II)

Time : 2 Hours   **Max. Marks: 70**

Note:(Missing data if, any can be assumed suitable)
PART – A
Answer any five questions.   **(5 x 2 = 10 Marks)**

1. Define Autotronics?
2. List out different types of sensors used in automobile
3. What is dwell angle?
4. What is the function of MAP sensor?
5. What is Thermal after-burning?
6. What is the use of EGR?
7. What are the Requirements of ABS?
8. What are the benefits of Active suspension?
9. Write note on Radio reception
10. How Obstacle avoidance radar will work

PART – B
Answer any four questions.   **(4 x 15 = 60 Marks)**

11.a) What is need for electronics in automotive control system explain in detail?
    b) List and explain the advantages of electronic control system in automobiles

12. Explain MPFI with help of neat sketch.

13.a) Discuss closed loop lambda control system for emission control.
    b) Explain complete vehicle control systems with the help of block diagram.

14.a) Explain Traction control system with help of block diagram.
    b) Explain On-board diagnosis system.

15. Explain Door locking system with help of circuit diagram.

16. Explain the operation of a gasoline direct injection (GDI) system.

17. Write short note on followings
    a) Transistors.
    b) Distributor – less ignition system.
    c) Seatbelt tensioners.

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FACULTY OF ENGINEERING
BE 4/4 (Civil) II-Semester (Backlog) Examination, December 2020

Subject: Estimation and Specifications

Time: 2 Hours   **Max .Marks: 75**

Note: (Missing data if, any can be assumed suitable)

PART – A

Answer any seven questions.   **(7 x 3 = 21 Marks)**

1. Explain detailed estimate and abstract estimate?
2. Difference between lead and lift.
3. What is a work order?
4. Explain the need of standard schedule of rates?
5. What are the conditions of contract?
6. Write down the unit weight of 20mm, 25mm steel rods for 1 meter length?
7. What is the economical depth of canal?
8. What is e-tender?
9. What is M book?
10. Write in detailed about I.S. 1200.

PART – B

Answer any three questions.   **(3 x 18 = 54 Marks)**

11) Estimate the following items from the fig.1 by using centre line method.

    i) Excavation of foundation
    ii) First class brick work from ground to plinth

12) Estimate the quantity of earthwork for a length of 1 km of road from the following data.

Chainage (m)	0	30	60	90	120	150
G.L	110	109	109.7	108.7	109.8	109.8

The formation width of road is 10m and the side slopes in cutting 1 : 1 and banking 2 : 1. and a gradient is 1 in 300 upward. Formation level at 0 meter chainage is 110.0m

13 Calculate the quantity of earthwork in embankment for a portion of a channel with the following data: Bed Width = 3 m; Free Board = 50 mm, Slop of cutting = 1 : 1, Slope in banking = 1.5 : 1; Full supply depth = 1m; Top width of both banks = 1.5m.

Distance (m)	0	20	40	60	80	100
Ground level (m)	422.24	424.80	424.43	424.12	424.50	424.98
Proposed bed level (m)	424.0	423.94	423.88	423.82	423.76	423.70

14 Compute the quantity of steel reinforcement in an R.C.C. roof slab of 4.5 m clear span, 7 m long and 180 mm thick, having 12 mm dia main bars at 15 cm c/c and 8 mm dia distribution bars at 20 cm c/c with alternate bent up bars. Also prepare schedule of bars of R.C.C. slab.

……2

15. a) Write the detailed specification of damp proof course (2.5cm thick) C.C 1:1.5:3

   b) Explain briefly about the specifications to be considered in RCC.

16. Find the rates of for the following items required for a building:

   (a) First class brick work in superstructure in cement mortar 1: 4 for 10 cu.m.
   (b) 1:2:4 CC required for slab and beam for 10 cu.m of RCC works
       The following rates at site may be considered:
       Sand Rs. 350 per cu.m.
       Aggregate Rs.800 per cu.m
       Cement Rs.320 per bag of 50 kgs
       Mixing mortar Rs. 50 per cu.m.
       Standard bricks Rs.20,000 per load (5000 nos)
       Steel Rs. 40000 per tonne
       First class mason Rs.500 / day
       Man mazdoor Rs. 400 / day
       Woman mazdoor Rs. 350 / day
       Bar building Rs. 15 / kg
       Centering and Shuttering Rs. 350 per cu.m.

17. Write a short note on any two of the following:
    a) Muster roll and security deposit
    b) Tender notice and bar bending schedule
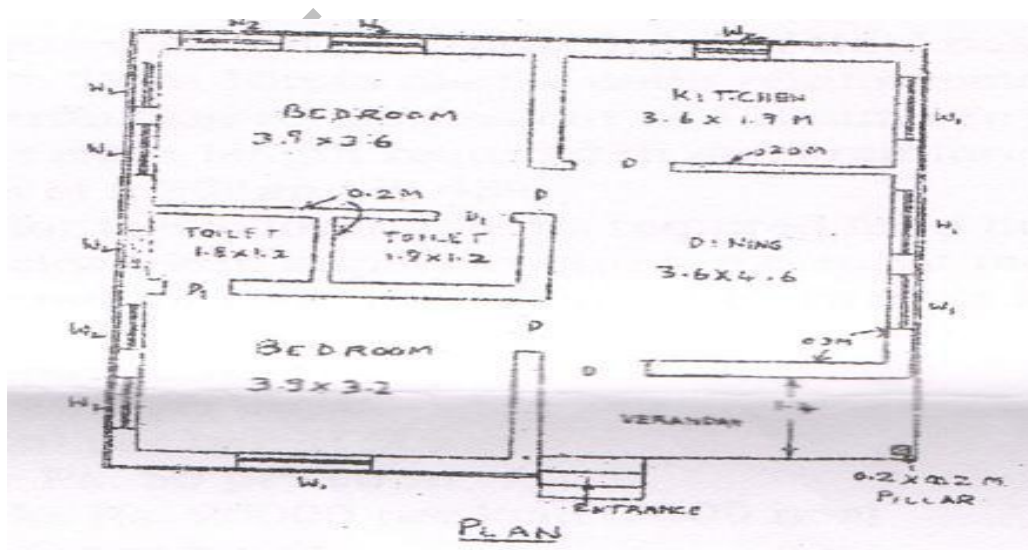   c) Departmental Procedure of construction work

Fig.1

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FACULTY OF ENGINEERING
BE 4/4 (Mech./Prod.) II-Semester (Backlog) Examination, December 2020

Subject: Production and Operations Management

Time : 2 Hours   Max. Marks: 75

Note: (Missing data if, any can be assumed suitable)
PART – A
Answer any seven questions.   **(7 x 3 = 21 Marks)**

1   List out the merits and demerits of product layout.

2   What do you understand by standard time? How you will calculate it?

3   State the objectives of forecasting.

4   Differentiate between Qualitative and Quantitative models of forecasting.

5   What is Master Production Scheduling?

6   Differentiate between MRP and MRP-II.

7   What are the various costs associated with inventory?

8   List out assumptions in simple EOQ.

9   Differentiate between Event and Activity.

10   Write the applications of CPM and PERT?

PART – B
Answer any three questions.   **(3 x 18 = 54 Marks)**

11 (a) What is meant by Incentive? Explain different types of Incentive plans.

   (b) What are the factors affecting the selection of a plant location, Explain briefly.

12 (a) Explain concept of aggregate planning.
   (b) What are the features of Enterprise Resource Planning? Also explain its limitations.

13 (a) Explain the deterministic and stochastic inventory model.

   (b) ABC India Ltd. company uses 10,000 units per year of an item. The purchase price is Rs.1/- per item. Ordering cost is Rs.25/- per order. Carrying cost per year is 12% of the inventory value. Find,

   (i)   The Economic Order Quantity
   (ii)   The number of orders per year
   (iii)   If the lead time is 4 (four) weeks and assuming 50 working weeks per year, find the reorder point.

14 Compute the simple exponential smoothing forecasts for the weekly demand data for mobile sets, in a large appliance store is as given below. Consider the values of α (alpha) to be (i) 0.1 and (ii) 0.3 how do the forecasts compare with the actual demands materialized? Comment on the response of the forecasts to the ups and downs in the demand.

Week No.	Demand (Units)
1	15
2	20
3	14
4	10
5	16
6	20
7	18
8	20
9	13
10	21
11	19
12	16
13	23
14	21
15	20
16	16
17	18
18	17
19	21
20	23
21	25
22	19
23	24
24	25

15 A project is composed of seven activities whose time estimates are as follows.

Activity		1-2	1-3	1-4	2-5	3-5	4-6	5-6
Times in weeks	t_o	1	1	2	1	2	2	3
	t_m	1	4	4	1	5	5	6
	t_p	7	7	18	1	14	8	15

(i) Draw a PERT network diagram
(ii) Calculate slack of each event
(iii) Identify Critical path
(iv) Find the duration of project.

16 (a) Explain the steps in Work study.
   (b) Briefly describe the Delphi technique.

17 Write short notes on the following.
   (a) System Application Product   (c) MAPE
   (b) Break even analysis   (d) Fulkerson's Rule

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B. E. 4/4 (I.T.) II – Semester (New) (Backlog) Examination, December 2020

Subject: Embedded Systems

Time: 2 hours   **Max. Marks: 75**

Note: (Missing data if, any can be assumed suitable)

PART – A

Answer any seven questions.   **(7 x 3 = 21 Marks)**

1. List of characteristics of embedded systems.
2. Differentiate microprocessor and microcontroller.
3. Differentiate MOVX and MOVC.
4. List all the SFR's used by 8051.
5. Distinguish between cross compiler and cross assembler.
6. Draw and explain task state diagram.
7. What is a re-entrant function?
8. Describe XCH and XCHD instrument with example.
9. List various laboratory tools used for debugging embedded systems.
10. Explain priority inversion.

PART – B

Answer any three questions.   **(3 x 18 = 54 Marks)**

11. Draw and explain 8051 pin configuration.

12. a) List and explain various logical instructions in 8051 with example.
    b) Explain jump and call instructions, with examples.

13. a) Explain how a LCD is interfaced with 8051 with a suitable diagram.
    b) Explain shared data problem and method used to solve it.

14. a) Explain features of µ-Cos real time operating system.
    b) Discuss various ways to get embedded software into target system.

15. a) Discuss ARM processors.
    b) Explain 12C bus and CAN bus.

16. a) Discuss the features of SHARC processor.
    b) Explain PUSH and POP, ROTATE and SWAP operations with example.

17. Write notes on any two of the following
    a) Design process of embedded systems.
    b) Hard real time scheduling considerations.
    c) Types of interrupts.

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FACULTY OF ENGINEERING

BE 4 / 4 (I.T.) II-Semester (Old) Examination, December 2020

Subject: Embedded Systems

Time: 2 Hours   **Max. Marks: 75**

Note: (Missing data if, any can be assumed suitable).

PART – A

Answer any seven questions.   **(7 x 3 = 21 Marks)**

1. Draw the various levels of abstraction in the embedded design process.
2. Distinguish between requirements and specifications.
3. What are register banks in 8051.
4. Draw and explain the structure of PSW of 8051.
5. Explain rotate and swap operations in 8051.
6. What is interrupt? How is it services?
7. Distinguish between Cross Complier and Complier.
8. Differentiate between and emulator and in circuit emulator (ICE) with a diagram.
9. What is pipeling mechanism?
10. Explain CAN protocol.

PART – B

Answer any three questions.   **(3 x 18 = 54 Marks)**

11. (a) Explain the challenges to design Embedded Systems.
    (b) Draw the block diagram of 8051 microcontroller with supporting hardware and explain.
12. (a) Explain the Register Structure in 8051.
    (b) Explain data transfer instructions in 8051. Discuss addressing mode supported by it.
13. Draw and explain the architecture of timers.
14. What is Multitasking? Explain how it is handled in RTOS.
15. (a) Describe the main features of Micro C/OS-II RTOS. What is a target system?
    (b) Describe the various types of semaphores used for ensuring mutual exclusion.
16. Explain different laboratory tools.
17. Explain with neat diagram:
    (a) ARM architecture
    (b) SHARC architecture

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BE 4 / 4 (CSE) II-Semester (Backlog) Examination, December 2020

Subject: Data Mining

Time: 2 Hours **Max. Marks: 75**

Note: (Missing data if, any can be assumed suitable).

PART – A

Answer any seven questions. **(7 x 3 = 21 Marks)**

1. Write the steps involved in data mining when viewed as a process of knowledge discovery?
2. Given two objects represented by the tuples (22,1,42,10) and (20,0,36,8). Compute the Euclidean distance and Manhattan distance between two objects?
3. Distinguish between Snowflake schema and fact constellation schema?
4. Write difference between Operation Database Systems and Data Warehouse?
5. Prove that all nonempty subsets of a frequent item set must also be frequent?
6. Write various criteria for classification of pattern mining?
7. Why is tree pruning useful in decision tree induction? What is drawback of using a separate set of tuples to evaluate pruning?
8. Compare the advantages and disadvantages of eager classification versus classification?
9. Illustrate the strength and weakness of k-means in comparison with k-medoids?
10. Write various challenges in outlier detection?

PART – B

Answer any three questions. **(3 x 18 = 54 Marks)**

11. (a) Discuss the issues to consider during data integration?
    (b) Propose an algorithm for the automatic generation of a concept hierarchy for numeric data based on the equal-width partitioning rule?
12. (a) What are the differences between information processing, analytical processing and data mining? Discuss the motivation behind OLAP mining?
    (b) Write a note on Metadata Repository?
13. How Apriori property is used to generate frequent item sets? Discuss the various methods on Apriori algorithm for improving its efficiency?
14. Write an algorithm for k-nearest-neighbor classification? Explain with suitable example?
15. What are Bayesian classifiers? Describe how to predict a class label using native Bayesian classification with an example?
16. Write K-means clustering algorithm and execute the algorithm for the points A1(2,10), A2(2,5),A3(8,4) B1(5,8), B2(7,5), B3(6,4), C1(1,2), C2(4,9) to form three clusters using Euclidean distance? Initially assume A1, B1, C1 as the center of each cluster respectively?
17. Discuss the various data mining applications with suitable examples.

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