FACULTY OF ENGINEERING

B. E. (Civil) (CBCS) VII – Semester (Main) Examination, December 2019

Subject: Estimation Costing and Specifications

Time: 3 hours   **Max. Marks: 70**
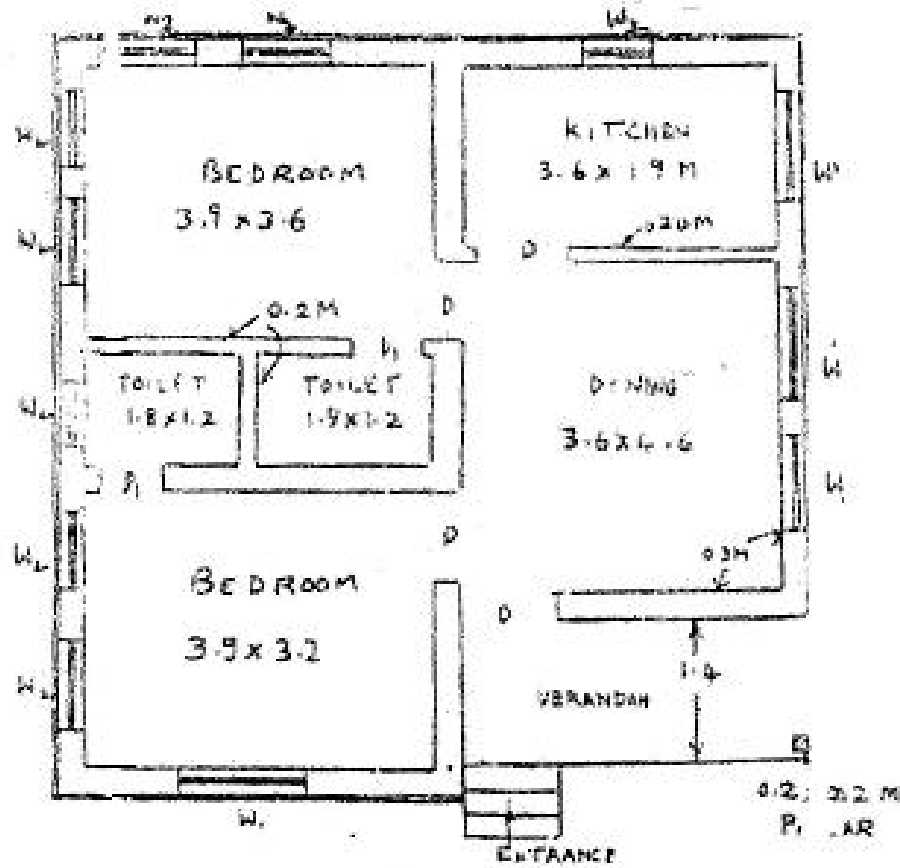
Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (20 Marks)

1. What do you mean by turn key projects?   (2)
2. What are the different conditions of contract?   (2)
3. What do you mean by standard data?   (2)
4. What procedure does the government follow for getting the work done on contract basis?   (2)
5. What do you mean by EMD and SD?   (2)
6. What are the additional conditions mentioned in tenders.   (2)
7. What do you mean by bar bending schedule?   (2)
8. Explain the different methods for calculating earth work in roads.   (2)
9. Draw and explain the different cross section of canals.   (2)
10. How do you prepare an estimate using computer software's?   (2)
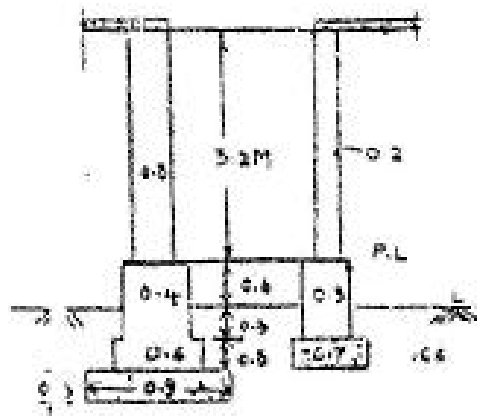
PART – B (50 Marks)

11. (a) Explain in detail about schedule of rates, bill of quantities and rate analysis.   (5)

    (b) What is a contract, mention essentials of contract and its various types?   (5)

12. (a) What is the role of IT in tenders and construction industry.   (5)

    (b) Identify and distinguish in details about the different Project delivery methods adopted for Shamshabad airport, L&T metro rail and water treatment plants.   (5)

13. 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.

BEDROOM
3.9 × 3.6

KITCHEN
3.6 × 3.9 M

0.2 M

TOILET
1.8 × 1.2

TOILET
1.8 × 1.2

DINING
3.6 × 4.6

0.2 M

BEDROOM
3.9 × 3.2

0.3 M

1.4

VERANDAH

0.2; 3.2 M
PILLAR

ENTRANCE

PLAN

SECTION OF
30CM WALL

SECTION OF
20CM WALL & VERANDAH
PLINTH WALL

3.2 M

0.2

0.8

0.4   0.4   0.5

0.6   0.8   0.7   0.6

0.9

P.L

FI 3.1

REFERENCE

DOOR D : 1.0 × 2.1 M
      D₁ : 0.8 × 2.1 M
WINDOW W : 1.5 × 1 M
       W₁ : 1.2 × 1 M
VENTILATOR : 0.7 × 0.3 M

NOTE : ALL DIMENSIONS ARE
       IN METRES

14. Estimate the quantities of earthwork with the following data. The formation width is 10m, side slope are 2:1 and a gradient is 1 in 300 upward. Formation level at 0 meter chainage is 110.0m. (10)

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

15. Calculate the quantity of earthwork in embankment for a portion of a channel with the following date: (10)
Bed Width = 3m; Free Board = 50mm
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 evel (m)	424.00	423.94	423.88	423.82	423.76	423.703

16. Compute the quantity of steel reinforcement in an R.C.C roof slab of 4.5m clear span, 7m long and 180mm thick, having 12mm dia main bar at 15cmc/c and 8mm dia distribution bars at 20 cm c/c with alternate bent up bars. Also prepare schedule of bar of R.C.C. Slab. (10)

17. Write a short note on: (10)

(a) How to prepare an estimate in M S Projects.

(b) Tender Notice.

(c) Work order.

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FACULTY OF ENGINEERING

B. E. (EEE) (CBCS) VII – Semester (Main) Examination, December 2019

Subject: Electric Drives and Static Control

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. Discuss various types of torques of an electrical drive.

2. Draw the block diagram of a closed loop electric drive.

3. Explain the dynamic braking of a dc motor with neat schematic.

4. If energy loss during starting of a 3-phase induction motor is 600W and assuming R_1 equal to R_2, then the total energy loss during dynamic braking, plugging, and speed reversal are _____, _____ and _____ respectively.

5. Explain why non-circulating current mode is superior to the circulating current mode with a neat schematic.

6. Draw the closed-loop speed control scheme of an electrical dirve.

7. Draw the schematic diagrams of slip-power recovery schemes of an induction motor.

8. What is a Cycloconverter? Draw the schematic of 3-phase Cycloconverter.

9. What is a BLDC motor? Why sensors are required for conventional BLDC motors?

10. What is the principle of operation of Switched Reluctance Motor?

PART – B (5 x 10 = 50 Marks)

11. (a) What is an Electrical Drive?   3

    (b) Explain the four-quadrant operation of a motor driving a hoist load with neat schematic.   7

12. Obtain the equilibrium points and determine their steady-state stability when motor torque and load torque are by, $T_m = -1-3\omega_m$ and $T_L = -5\sqrt{\tilde{S}_m}$.   10

13. (a) Describe how Rheostatic braking can be performed on a separately excited dc motor and draw its speed-torque characteristics.   5

    (b) A 220 V, kW DC shunt motor running at its rated speed of 1200 rpm is to be braked by reverse current braking. The amature resistance is 0.1 ohm and the rated efficiency of the motor is 88%. Calculate   5

      (i) The resistance to be connected in series with the armature to limit the initial braking current to twice the rated current.

      (ii) The initial braking torque.

14. Explain the operation of a single-phase full converter fed to separately excited dc drive with neat schematic and waveforms. Calculate the average value of output voltage at 'α' fringe angle. Assume continuous armature current operation. 10

15. A 200V, 1000rpm, 125A separately excited dc motor has an armature resistance of 0.055Ω. It is fed from a single-phase half-controlled converter with an ac source voltage of 230V, 50Hz. Assume continuous conduction, calculate

   (a) Firing angle for rated motor torque and 700 rpm. 5

   (b) Firing angle for rated motor torque and -250 rpm. 5

16. Explain the operation of VSI with neat schematic of sequence of firing and waveforms with angle of conduction assuming 120^0 conduction mode. 10

17. With a neat schematic, explain the operation of self-controlled synchronous motor drive. 10

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FACULTY OF ENGINEERING

B. E. (Inst.) (CBCS) VII – Semester (Main) Examination, December 2019
Subject: Virtual Instrumentation

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. Compare data flow programming with non data flow programming.   2
2. What is sub-VI?   2
3. Distinguish local and global variable.   2
4. What is a sequence structure? Write its types.   2
5. Distinguish timers and counters.   2
6. What is PXI?   2
7. Draw block and front panel of a VI to find FFT of a signal.   2
8. Why current loop communication is more secure than voltage?   2
9. List the various components of DAS.   2
10. What is single drop and multi drop interfacing with buses?   2

PART – B (5 x 10 = 50 Marks)

11. Give a detail discussion on History evolution of virtual instrumentation from conventional instrumentation.   10
12. Explain the different components of front panel and block diagram with examples.   10
13. What is the use of ADC, DAC and DIO in data acquisition? Explain with an example.   10
14. What is IEEE488 bus? Explain its pin configuration.   10
15. Write short notes on

    (a) VXI.   5

    (b) Interrupts and DMA.   5

16. List and explain the important image processing algorithm. Discuss the necessary software and hardware available for the same in NI for Lab VIEW.   10
17. Write the features of RS232C? Explain its signals and functions.   10

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FACULTY OF ENGINEERING

B.E. VII-Semester (CBCS) (ECE) Main Examination, December 2019
Subject: Embedded System

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 the salient features of embedded processors.   [2]
2. Why should be the embedded CPU clock speed is suggested to be in the range of
   MHz clock instead of GHz clock?   [2]
3. What is the nomenclature of ARM{x}{y}{z} TDMI core?   [2]
4. What are the factors for selecting a processor during the system design phase?   [2]
5. Write any three important advantages of PCI/PCI-X compared with Industry
   Standard Architecture (ISA).   [2]
6. What is AMBA bus? Mention any two important characteristics of it in ARM.   [2]
7. Why is a host system used for most stages of development, test and simulation?   [2]
8. Explain the software-hardware tradeoff in an embedded system design.   [2]
9. Give examples of hardware dependent and hardware independent codes.   [2]
10. Give two advantages of Instruction set simulators.   [2]

PART – B (50 Marks)

11. a) Describe a System- On- Chip. Compare it with an embedded system.   [5]
    b) Describe the design process involved in a typical embedded system design.   [5]

12. a) Explain about ARM core architecture with the help of a neat diagram and
       also explain about ARM core extension.   [6]
    b) Describe the various multiply instructions of ARM with their syntax.   [4]

13. a) Compare and contrast between serial and parallel bus protocols with
       examples.   [5]
    b) Describe the various Internet enabled system network protocols.   [5]

14. a) What are the various developmental phases in the design of an embedded
       system?   [5]
    b) What are the Co-design issues typically faced during embedded system
       design? Explain.   [5]

15. a) Describe the role of linker/locator in the embedded software development.   [4]
    b) A digital camera is to be designed in a project. What will be the skills needed
       in terms of hardware and software engineers?   [6]

16. a) What are the various hardware and software debugging techniques being
       adopted for testing the embedded system design?   [5]
    b) What are the objections, limitations and shortcomings of testing embedded
       system code on the host system?   [5]

17. Write short note on any two of the following: [10]
    a) Modes of operation in ARM.
    b) IEEE 1394 bus standard.
    c) Logic Analyzer modes of operation.

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FACULTY OF ENGINEERING

B.E VII Semester (CBCS) (M/P)(Main) Examination, December 2019
Subject: Finite Element Analysis

**Time: 3 Hours**   **Max. Marks: 70**

Note: Answer all questions from Part A. & any five questions from Part B.

PART– A (20 Marks)

1. Explain the principle of Minimum potential energy.   2
2. Distinguish between plane stress and plane strain condition.   2
3. Evaluate the integral of $I= +20x - 40x^2)dx$ by using Gaussian quadrature for two approximations.   2
4. Differentiate between lumped & consistent mass matrix.   2
5. Explain the properties of Eigen values and Eigen vectors.   2
6. What are multipoint constraints?   2
7. Describe the strain displacement matrix for 3-noded triangular element.   2
8. Write the stiffness matrix of a frame element.   2
9. Write about Natural Coordinate systems used in FEM.   2
10. What is thermal conductivity matrix for 2D heat transfer problems?   2

Part–B (50 Marks)

11. Calculate displacement vector, stress and reactions for the following bar structure. There is wall existing at the other end and the gap between end of the bar and the wall is 2 mm as shown in Fig.1. Take E= 2x 10^5 N/mm^2.   10
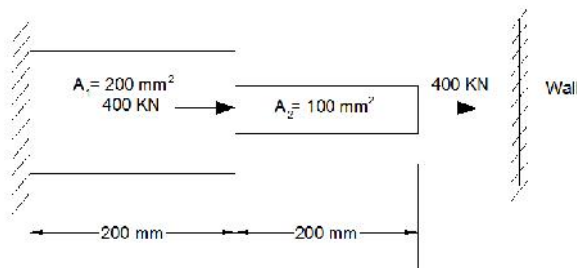
12. For a truss structure show in Fig.2 subjected to a horizontal load of 4kN in positive X direction at node 2. a) Find the nodal displacements b) Stresses in all elements.   10
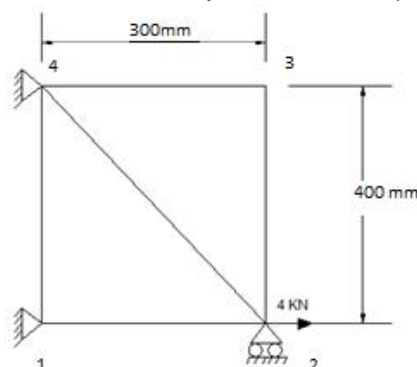

Fig.2

…..2

13. a) What is Constant strain triangular element? State its properties and applications.   3

b) The nodal coordinates of the triangular element are shown in Fig.3, at the interior point P the X coordinate is 3.3 and the shape function at node 1 is N_1 is 0.3, Determine the shape functions at nodes 2 & 3 also y coordinate of the point P.   7
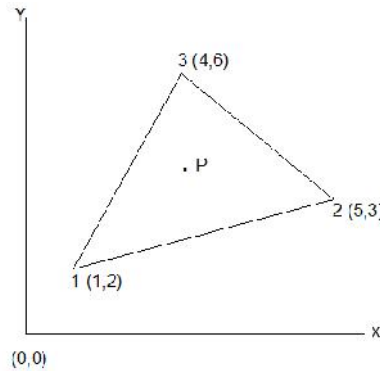

Fig.3

14. Develop the assembled stiffness matrix and the deflection at the center of the simply supported beam of length 3m where a 50kN load acting at the center of the beam. Take EI = 800 x 10^3 N-m^2.   10

15. a) Evaluate a Numerical Integral $I = \int x + x^2 + \frac{1}{x+2}] dx$ using Gaussian quadrature with two point formula and also compare with the exact solution.   7

b) With the suitable example explain the formulation and properties of an axis symmetric element.   3

16. a) Explain natural and essential boundary condition on a heat transfer problem for a 1D element.

b) Heat generated in a large plate (0.8 w/m^0 k) at the rate of 4000 w/m^3. The plate is of thickness 25cm. The outer surface is exposed to an ambient air with a heat transfer coefficient of 20w/m^2k at 30^0C. If the inside temperature is 500^0C. Calculate the temperature at a distance of 10cm from the inner wall. Assume the cross sectional area as 62.5 mm^2.

17. Determine the natural frequencies of a simply supported beam of length 800mm with cross section area of 750 x 250mm as shown in Fig.5 Take E = 200 GPa and density 7850 kg/m^3.   10
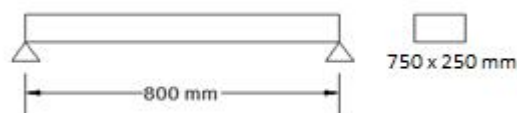

Fig.5

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FACULTY OF ENGINEERING
BE VII semester (CBCS) (A.E.)(Main) Examination, December 2019
Subject: Vehicle Maintenance

Time: 3 Hours   **Max. Marks: 70**

Note: Answer all questions from Part A, & any five questions from Part-B

PART – A (10 x 2 = 20 Marks)

1   Write 5 safety precautions in maintenance.

2   Distinguish between preventive and breakdown maintenance.

3   Describe inspection procedure of cylinder block.

4   Define engine tune up.

5   Explain the troubles associated with gear box.

6   What is meant by wheel shimmy?

7   Which measuring tool is used to measure clearance between rocker arm and valve stem? And write the firing order of 6 cylinder engine.

8   What are the probable causes for non-function of an electric horn of a car?

9   Why a thermostat is required in a vehicle cooling system?

10 What is the purpose of anti-freezing solutions? Name some of the anti-freezing solutions.

PART – B (5 x 10 = 50 Marks)

1. Explain various types of records, books and forms that are being used in an automotive service station of cars.   10

12. (a) List out the tools used for assembly of an engine.   5
    (b) Explain the step-by-step procedure for disassembly of an S.I. engine.   5

13. Briefly explain various troubles that may occur in a single plate dry clutch system and bring out their causes.   10

14. (a) Why a solenoid is used in the starting circuit of an automobile?   5
    (b) Write the functions of   i) Scan tools   ii) Starter motor.   5

15. Explain briefly the maintenance and serving of automobile electrical   systems.   10

16. (a) Explain the types of tyre wear.   5
    (b) Explain Vehicle body maintenance.   5

17. Write short notes on the following:
    a) Brake Bleeding   3
    b) FIP calibration Machine   4
    c) Body panel repair procedure   3

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FACULTY OF ENGINEERING

B. E. (CSE) (CBCS) VII – Semester (Main) Examination, December 2019
Subject: Distributed systems

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. List out the goals of distributed systems.
2. Define process and threads.
3. What are interceptors?
4. List out clock synchronization algorithms.
5. What are the 3V's of Big Data?
6. What is directory information tree (DIT)?
7. State semantic sub object and communication sub object.
8. Name the different kinds of enterprise Java Beans (EJB).
9. What is meant by aliase?
10. Differentiate cluster computing systems and grid computing systems.

PART – B (50 Marks)

11. (a) Write short notes on architectural styles of distributed systems.   (4)

    (b) Explain the types of distributed systems.   (6)

12. Explain in detail election algorithm.   (10)

13. Brief how files are distributed in distributed file systems with its architecture.   (10)

14. (a) How consistency and replication is maintained in distributed coordination based
    system.   (5)

    (b) Discuss the issues in Fault tolerance for distributed file systems.   (5)

15. Write short notes on:

    (a) Data centric consistency model.   (5)

    (b) Client-centric consistency model.   (5)

16. Explain in detail about distributed commit protocol.   (10)

17. Explain the features of Apache Pig.   (10)

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FACULTY OF ENGINEERING

B.E. (I.T) VII – Semester (CBCS) (Main) Examination, December 2019

Subject: Big Data Analytics

Time: 3 Hours   **Max.Marks: 70**

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

PART – A (10x2 = 20 Marks)

1. What are the applications of Big Data?
2. What do you mean by block caching in HDFS?
3. Define a materialized view.
4. What are the different ways to construct version stamps in NoSQL?
5. What are the different types of failures in Map Reduce?
6. Compare MapReduce1 and YARN.
7. What are the Mongo DB CRUD operations?
8. What are the different modes of executing Pig?
9. What is the purpose of H Catalog?
10. What are the different Hive services?

PART – B (5x10 = 50 MARKS)

11 a)	Explain the challenges posed by Big Data.	(5)
b)	Explain structured, semi structured and unstructured data in Big Data analytics.	(5)
12 a)	Define HDFS. Describe namenode, datanaode and block. Explain HDFS operations in detail.	(6)
b)	How do you read data from a URL in Hadoop?	(4)
13 a)	What are the various distribution models in NOSQL? Explain.	(5)
b)	Explain the aggregate data models.	(5)
14 a)	Write a Unit Test with MR Unit.	(5)
b)	Explain briefly about the Map Reduce types and formats.	(5)
15 a)	Explain the procedure for installing Pig and running Pig programs.	(5)
b)	Explain User Defined Functions(UDF) in Pig.	(5)
16 a)	Explain briefly about HiveQL.	(5)
b)	Explain the architecture of Hive.	(5)
17	Write notes on the following.	
a)	YARN based execution model	(5)
b)	Comparing Hive with databases.	(5)

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FACULTY OF ENGINEERING

B.E. 4/4 (Civil) I-Semester (Old) Examination, December 2019

Subject: Estimating and Specifications

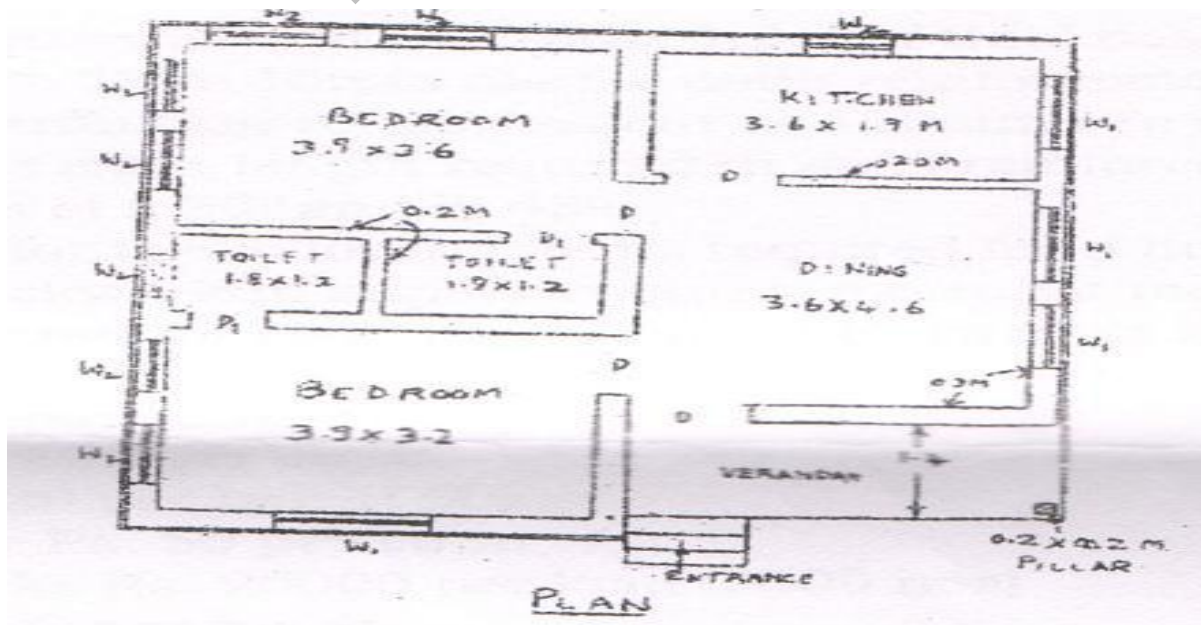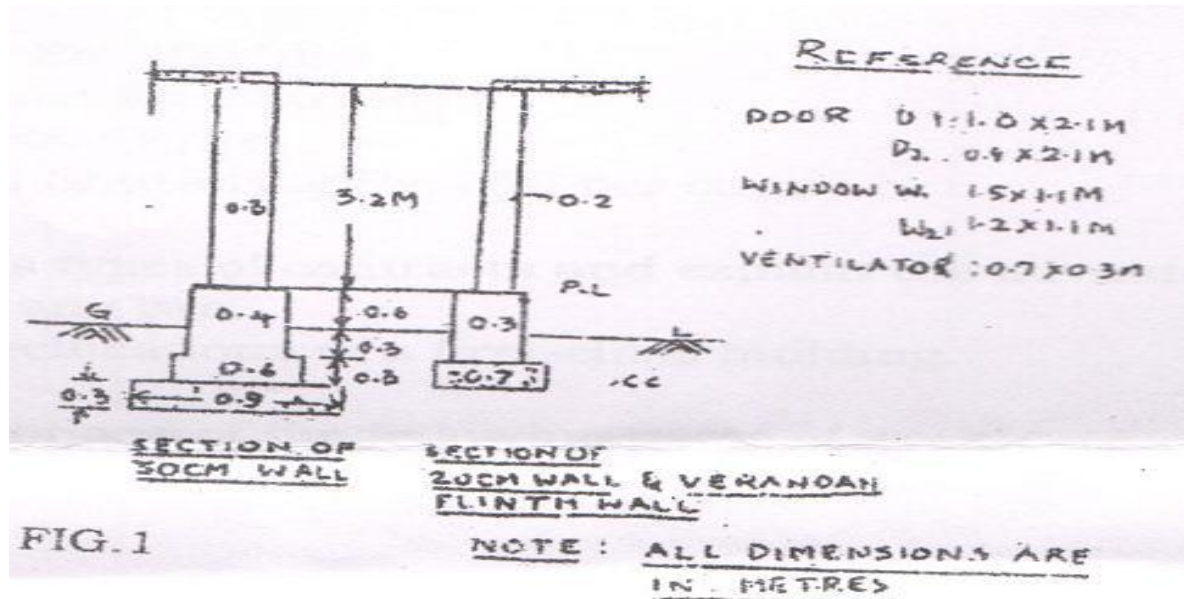**Time: 3 Hours**   **Max. Marks: 75**

Note: Answer all questions from Part - A & answer any five questions from Part-B.

PART – A (25 Marks)

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

PART – B (5 x 10 = 50 Marks)

11. 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

PLAN

REFERENCE

DOOR D 1: 1.0 x 2.1M
D₂ .. 0.4 x 2.1M
WINDOW W₁ 1.5 x 1.1M
W₂ 1.2 x 1.1M
VENTILATOR : 0.7 x 0.3m

SECTION OF 50CM WALL

SECTION OF 20CM WALL & VERANDAH PLINTH WALL

FIG. 1

NOTE : ALL DIMENSIONS ARE IN METRES

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 (10)

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. (10)

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 (10)

15) a) Write the detailed specification of damp proof course (2.5cm thick) C.C 1:1.5:3 (5)

b) Explain briefly about the specifications to be considered in RCC. (5)

16) Find the rates of for the following items required for a building: (10)

    (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: (10)

    a) Muster roll and security deposit

    b) Tender notice and bar bending schedule

    c) BOT and BOOT with examples

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FACULTY OF ENGINEERING

B.E.4/4 (Civil) I-Semester (Backlog) Examination, December 2019

Subject : Construction Management and 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	State the main objectives of construction management	3
2	What do you mean by a dummy activity	2
3	Define activity, event and network	3
4	Define the terms (i) Direct cost (ii) Indirect lost	2
5	Define the tender document	3
6	What is the role of slope in networks	2
7	List different types of construction contracts	3
8	Explain causes of accidents on a construction site	2
9	Why the non negativity condition exist in LP model	3
10	Name three basic Parts of simplex techniques	2

Part –B (50 Marks)

11 List the three types of organizations and explain detail about any two organizations.   10

12 Develop a network for a project comprising nine activities determine the total float
For each activity and establish the critical path also calculate earliest start time,
Earliest finish times, latest start time and latest finish time   10

Activity	1-2	1-3	1-4	2-6	3-4	3-5	3-6	4-5	5-6
Duration weeks	3	4	14	5	3	4	6	4	5

13 Determine the optimum cost and duration for the project network the data for each
activity of network is given in the following table Indirect cost is Rs 3500/- per week   10

Activity	Normal duration Weeks	Normal Cost (Rs)	Cash duration Weeks	Crash cost (Rs)
1-2	6	5000	4	8000
1-3	3	3500	1	5000
1-4	6	7000	3	9000
2-3	9	5500	5	8000
2-5	9	6000	6	10000
3-5	4	4000	2	6000
4-5	7	7000	3	9500

14 a) List the limitations of Bar charts and explain how these limitations can be
overcome   5

b) Explain the provisions of workmen's compensation act   5

15 a) What are tender documents? Discuss briefly the contents of typical tender documents   5
   b) What are the essential features of a construction contract   5

16 Solve graphically the following LP problem   10
   Minimize Z = 2x₁ + x₂
   Subject to constraints $5x_1 + x_2 \geq 9$
   $$2x_1 + 2x_2 \geq 10$$
   With $x_1 \geq 0$ $x_2 \geq 0$

17 Write about
   a) Large scale projection   5
   b) Demolition of Buildings   5

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FACULTY OF ENGINEERING

BE 4/4 (Inst.) I-Semester (Backlog) Examination, December 2019

Subject : Virtual Instrumentation

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 Virtual Instrumentation? How it is different from conventional instrumentation   3

2. Write the phases of historical development of Virtual instruments   2

3. Describe about the environment of Lab VIEW   2

4. Differentiate between local and global variable   3

5. Why signal conditioning is needed in Data Acquisition system?   2

6. What is the role of timing and synchronization in DAS   3

7. List the common instrument bus   2

8. What do mean by Talker, Listener in GPIB bus system?   3

9. Draw the block diagram and front of Lab VIEW program to find PSD of a signal   3

10. Explain in brief the architecture of USB   2

PART- B (5 x 10 = 50 Marks)

11. Explain in detail the different blocks of Front panel and block diagram of Lab VIEW   10

12. What is sub-VI? Give analogous of it in C programming, and explain the procedure To create it using an example   10

13 a) Explain the working of different loops with its accessories (i.e shift register and feedback node) in Lab VIEW   6
   b) What is formula node? How it is different from other VI nodes   4

14 Why net working is essential for Industrial and office applications? Also give detail classification of networking   10

15 Write the features of Rs232C? Explain its signals and functions.   10

16. Write a Lab VIEW program to use FIR filter to filter a signal   10

17. Write short notes on: 10
   a) ADC and DAC and

   b) Interrupt and DMA of Data acquisition system.

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FACULTY OF ENGINEERING

B.E. 4/4 (ECE) I-Semester (Backlog) Examination, December   2019

Subject : Electronic Instrumentation

Time: 3Hours   **Max. Marks: 75**

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

PART- A (25 Marks)

1. Define accuracy, precision, resolution, sensitivitys inverse sensitivity   3

2. What are primary and secondary standards.   2

3. What are the different factors that affect the selection of the transducers   2

4. A resistance wire strain gauge with the gauge factor of 2 is bonded to a steal member subjected to a stress of 100 MN/m^2. The modulus of elasticity of steel is 200 GN/m^2. Calculate the percentage change in the value of the gauge resistance due to the applied stress.   3

5. What is hygrometer? Define absolute humidity and relative humidity.   3

6. Define the following characteristic of sound: Pitch, Quality and Loudness.   2

7. List out the salient features of mixed signal oscilloscope.   2

8. List the advantages of DVMs over analog voltmeters.   3

9. Explain the working principle involved in ultrasonic imaging systems   3

10. Define the terms Action potential and Resting Potential (with waveforms)   2

PART- B (50 Marks)

11. a) Discuss about elements of ISO 9001 RT and IEEE standards.   (6)

    b) Explain in detail different types of systematic errors.   (4)

12 a) Define gauge factor and derive K = 1+2 ~ .   (5)

    b) Explain the piezoelectric phenomenon and how it tends itself for the measurement of force.   (5)

13 a) Explain the operation of thermocouple with a neat diagram and its advantages and disadvantages.   (5)

    b) Distinguish between humidity and moisture. Explain different methods used for measurement of humidity.   (5)

14. a) Explain the working principle of ramp type DVMs with relevant diagrams.   (5)

    b) Explain about IEEE 488 or general purpose interface bus.   (5)

15 a) Classify and brief about bio-potential electrodes.   (5)

    b) Discuss about various types of electrodes used in EMG.   (5)

16 a) Explain how rate of fluid flow is measured using a hot – wire anemometer.   (5)

    b) Explain the basic principle involved in spectrum analyzers with a neat block.   (5)

17. Write short note on the following:

    a) Virtual instrumentation   b) Ultra sonic imaging system.   (5+5)

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FACULTY OF ENGINEERING

B.E. 4/4 (ECE) I Semester (old) Examinations, December 2019
Subject: Computer Networks

Time: 3 Hours   **Max. Marks: 75**

Note*: Answer all questions from Part-A*, & any five questions from Part-B.

PART – A (25 Marks)

1	What is the significance of layered architecture?	2
2	What are the functions of Data link layer? What is meant by framing?	3
3	Compare ALOHA and slotted ALOHA.	2
4	Calculate efficiency of stop and wait protocol.	3
5	What is congestion control?	2
6	Explain the terms congestion collapse and onset of congestion.	3
7	Write notes on sliding window of TCP.	3
8	Explain briefly the concept of Berkeley Sockets.	3
9	What is the need of data encryption and decryption?	2
10	Briefly describe the parts of URL.	2

PART – B (50 Marks)

11 (a) Explain about the OSI reference model, responsibilities of each layer in the model.   5

(b) What are the flow control techniques employed at the data link layer? Derive the expression for efficiency for any one technique.   5

12 (a) Describe the flow control in HDLC protocol.   5

(b) Explain details of IEEE 802.11 based wireless network (in terms of the MAC Protocols).   5

13 (a) Explain about static and dynamic routing algorithms in brief.   4

(b) What are the various routing strategies? Explain Bellman and Ford algorithm with an example.   6

14 (a) Explain in detail the frame format of TCP.   5

(b) Describe briefly the architecture of ATM.   5

15 (a) Write short notes on Public Key cryptography.   5

(b) Describe architecture of E-mail and World Wide Web (WWW).   5

16 (a) What is data communication? Explain about the components of a Data communication System.   5

(b) Explain in detail any three applications of UDP.   5

17 (a) Write notes on ARQ.   4

(b) Explain the layered model of blue tooth with the help of a neat diagram. Describe how communication takes place between the master and **slave(s)** in this technology?   6

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FACULTY OF ENGINEERING

BE 4/4 (Mech.) I – Semester (Backlog) Examination, December 2019
Subject: Thermal Turbo Machines

Time: 3 Hours   **Max. Marks: 75**

Note: Answer All Questions from Part –A, & Any Five Questions from Part - B
PART – A (25 Marks)

1 Explain the terms Mach number, Mach cone and Mach Angle.

2 What are the applications of Rayleigh curve?

3 Define chord, angle of attack and camber in an aerofoil.

4 Write the differences between centrifugal and axial flow compressors.

5 Draw the velocity triangle of a 50% reaction steam turbine.

6 Give the relation among the blade, nozzle and stage efficiencies of steam turbine.

7 List the merits of open cycle gas turbine over closed cycle configuration.

8 State the advantages and disadvantages turbo jet.

9 Write the differences between solid propellant and liquid propellant.

10 Define propulsive efficiency, thermal efficiency and overall efficiency of an Aircraft propulsion system.

PART – B (50 Marks)

11. A gas ($=1.4$, R=0.287 kJ/kg – K) at P_1=1. 0bar, T_1=400 K enters a 30 cm   (10)
    diameter duct at a Mach number of 2.0. A normal shock occurs at a Mach
    number of 1.5 and exit Mach number is 1.0. If the mean value of friction factor is
    0.003 determine
    (i) Length of the duct upstream and downstream of the shock wave,
    (ii) mass flow rate of gas.

12. Derive Rankine-Hugoniot equation   (10)

13. An axial flow compressor with an overall isentropic efficiency of 82% draws air at   (10)
    18°C and compresses it in the pressure ratio of 5:1 .The mean blade speed and
    flow velocity are constant throughout the compressor. Assume 50% reaction
    blading. Take blade velocity as 242 m/s and work input factor as 1.05, calculate
    (i) flow velocity and
    (ii) number of stages. Assume =15° and =45°.

14. In an open cycle constant pressure gas turbine, air enters the compressor at 1bar   (10)
    and 300 K. The pressure ratio is 4:1. The isentropic efficiencies of compressor and
    turbine are 78% and 85% respectively. The air fuel ratio is 80:1, calculate the power
    developed and thermal efficiency of the cycle if the flow rate of air is 2.5 kg/sec.
    Assume C_p=1.005k J/Kg-K,   =1.4 for air C_{pg} = 1KJ/Kg,   = 1 .33 for gases, R=0.287k
    J/kg-K, calorific value of fuel is 42000 kJ/kg.

15. In a De Laval turbine, the steam enters the wheel through a nozzle with a velocity of 500 m/s and at an angle of 20°. The blade speed is 200 m/s and the exit angle of the moving blade is 25°. Find the inlet angle of the moving blade, exit velocity of steam and work done per kg of steam. (10)

16. (a) Draw a configuration diagram and temperature entropy diagram for a gas turbine cycle with regeneration. (5)

   (b) In a gas turbine plant, operating on Joule cycle, air is compressed from 1 bar (5) and 15°C through a pressure ratio of 4.5. It is then heated to 700°C in a combustion chamber and expanded to a pressure of 1bar. Calculate the net work done, cycle efficiency and work ratio.

17. (a) Distinguish between reciprocating and rotary compressor. (5)
    (b) With the help of neat sketch explain the principle and working of Ram jet engine. (5)

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FACULTY OF ENGINEERING

B.E. 4/4 (Production) I-Semester (Backlog) Examination, December 2019

Subject : Control Systems Theory

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 Distinguish between open loop and closed loop systems.   2
2 What is the effect of feedback on overall gain of a control system?   2
3 The open loop transfer function for a servo system with units feedback
   $G(S) = \dfrac{10}{S(S+10)}$. Find the static error constants.   3
4 Define the terms :
   a) step signal   b) Ramp signal   c) Parabolic signal   3
5 Sketch the polar plot of $G(S) = \dfrac{1}{S(1+ST)}$.   3
6 What are the advantages of frequency response techniques over time domain
   techniques.   3
7 Define routh-stability criteria.   2
8 Define STM and its properties.   3
9 Define controllability and observability.   2
10 What is the effect of lead, lag compensations on the system performance?   2

PART – B (50 Marks)

11 Obtain the transfer function of a Electro-mechanical servo system.   10

12 Obtain the transfer function by using the block diagram reduction method.   10
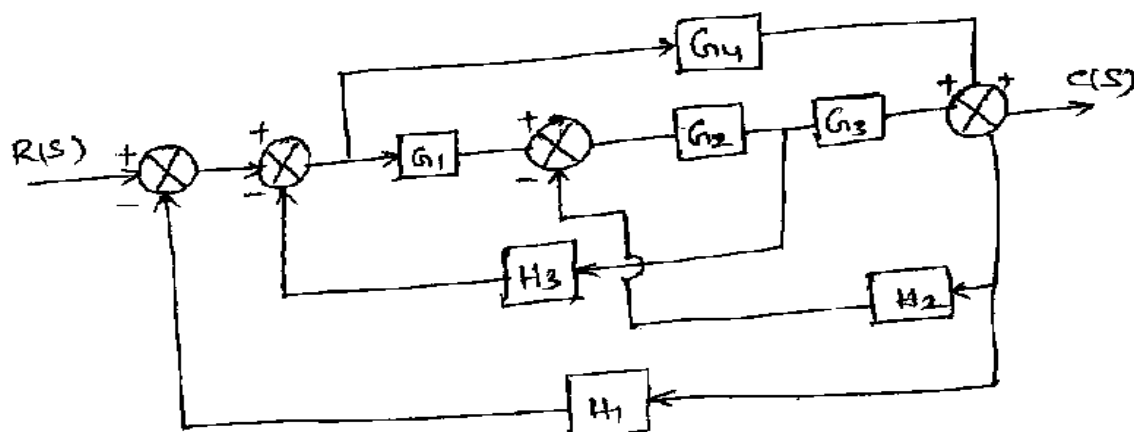

Fig (1).

13 Draw the bode plot for the control system $G(S) = \dfrac{KS}{(S+5)(S+20)(S+50)}$ and determine the value of 'K', GM and PM.   10

14 Sketch the Nquist plot for the system $G(S)H(S) = \dfrac{1.25(S+1)}{(S+0.5)(S-2)}$.   10

15 Obtain the state space model and check for observability of a control system.   10

$$\frac{Y(S)}{U(S)} = \frac{S+2}{S^3 + 9S^2 + 26S + 24}$$

16 Sketch the root locus plot for the system having $G(S) = \dfrac{K}{S(S+1)(S+3)(S+4)}$

Find the range of 'K' that yields a stable system.   10

17 Discuss the following :   10
   a) Linearization and non-linearization system.
   b) Correlation between transient response and frequency response of a 2nd order system.
   c) Nquist stability criteria

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FACULTY OF ENGINEERING

B. E. 4/4 (A.E) I – Semester (Backlog) Examination, December 2019
Subject: Transport Management

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. Explain characteristics of a good personnel policy.
2. Define Training and its need.
3. What is 'Running time' and maintenance time?
4. Differentiate between Public and Private Transport.
5. What is vehicle utilization?
6. What is operating cost?
7. What is contract carriage?
8. State the importance of Traffic signs.
9. What are the aims and objectives of Industrial Psychology?
10. What is spread over?

PART – B (5 x 10 = 50 Marks)

11. (a) Explain Psychological Tests.   5

    (b) State the training objectives and their advantages.   5

12. (a) Explain state, public and municipal ownership of motor transport organization.   5

    (b) Classify and explain the different transport carriers.   5

13. (a) Explain the requirements of good fare system.   5

    (b) Explain various types of fare collecting systems.   5

14. (a) Explain constructional regulations and descriptions of tanker, tipper, recovery vans and fire fighting vehicles.   5

    (b) Explain permit and its classifications.   5

15. Explain in detail the causes for uneven tire wear in detail.   10

16. Explain the facilities required at depot and draw the layout of a depot.   10

17. (a) Prepare a brief report on ticketing system and types of tickets.   5

    (b) Write a short note on registration requirement.   5

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FACULTY OF ENGINEERING
B.E. 4/4 (CSE) I-Semester (Backlog) Examination, December 2019

Subject : Distributed Systems

Time : 3 Hours   **Max. Marks: 75**

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

PART – A (25 Marks)

1	What are the challenges of Distributed Systems?	(2)
2	Define a Process.	(2)
3	Differentiate between marshaling and unmarshalling.	(3)
4	Explain briefly about file service architecture.	(3)
5	Distinguish between static and dynamic RMI.	(3)
6	What are fault tolerant services?	(2)
7	What are nested transactions? Give an example.	(3)
8	How distributed dead locks are detected?	(3)
9	What are vector time stamps?	(2)
10	List out various tasks of recovery manager.	(2)

PART – B (50 Marks)

11 (a) Explain briefly about architecture models of distributed systems. (5)

    (b) Discuss about operating system architecture. (5)

12 Describe inter process communication in UNIX with an example. (10)

13 (a) What are Mutual Exclusion algorithms? Explain with an example. (7)

    (b) Explain about edge chasing. (3)

14 (a) Explain in detail about nested distributed transactions with proper examples. (5)

    (b) Explain about concurrency control algorithms. (5)

15 (a) Explain about operating system support in distributed systems. (5)

    (b) Explain in brief about process status and synchronizing physical clocks. (5)

16 Explain the design and implementation issues of Distributed Shared Memory. (10)

17 Write short notes on:

    (a) Remote Reference Object (3)

    (b) X.500 Directory Service (3)

    (c) File Service Architecture (4)

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