

THIAGARAJAR POLYTECHNIC COLLEGE, SALEM

(Autonomous)

Reg. No. 

April 2019 Examinations

DIPLOMA IN ARCHITECTURAL ASSISTANTSHIP

Structural Design

Year/Sem: III / VI (EVEN-III)

Max. Marks : 75

Time : 3 hr.

**Note:** (i) Use of IS 456-2000, IS 800 – 2007, Steel tables are permitted.

(ii) Assume suitable data if necessary.

**PART-A****(5 x 2 = 10 Marks)****Note:** (i) Answer any FIVE questions out of which question No.8 is compulsory.

(ii) All questions carry equal marks.

- 1 How design load is determined from characteristic load?
- 2 What is meant by doubly reinforced section?
- 3 Define One way slab.
- 4 When a slab is to be designed as a two way slab?
- 5 Write the types of staircase.
- 6 Define Short axially loaded compression member.
- 7 Write any two classifications of Steel Beams.
- 8 Define Nominal Shear Stress.

**PART-B****(5 x 3 = 15 Marks)****Note:** (i) Answer any FIVE questions out of which question No. 16 is compulsory.

(ii) All questions carry equal marks.

- 9 What are different Limit States?
- 10 Specify maximum spacing for main reinforcement in slab.
- 11 When Torsion reinforcement is provided for a Two way slab?
- 12 What are the forms of shear reinforcement?
- 13 Briefly explain effective span of stairs.
- 14 Briefly explain the check for shear for a isolated column footing.
- 15 Write about effective length of steel compression members.
- 16 State the assumptions in Limit State of collapse in compression.

**PART-C****(5 x 10 = 50 Marks)****Note:** (i) Answer all the questions choosing either sub-division (A) or sub-division (B) of each question.

(ii) All divisions carry equal marks.

- 17 A A RCC beam 300 mm × 500 mm effective size is reinforced with 4 Nos. of 16mm diameter bars in its tension zone. Fe415 grade steel and M20 grade concrete are used. Determine the limiting moment of resistance of the section by limit state method. 10

**(OR)**

- B A cantilever beam of rectangular section 300 mm wide and 600 mm overall depth has to carry an udl of 25kN/m (inclusive of self weight) over an effective span of 3 metre. M20 grade concrete and Fe415 grade steel are to be used. Design the reinforcement for flexure by limit state method. 10

- 18 A A hall has clear dimension 3.2m x 10m with wall thickness 230mm. The Live load on the slab is 3kN/m<sup>2</sup> and a finishing load of 1kN/m<sup>2</sup> may be assumed. Using M20 grade concrete and Fe415 Steel, design the slab. 10

**(OR)**

- B Design a reinforced concrete slab for a room of size 5.0m x 4m clear, if the superimposed load is 4kN/m<sup>2</sup>. Use M20 grade concrete and Fe415 Steel. The edges are simply supported and corners are not held down. 10

- 19 A A reinforced rectangular beam is subjected to a design shear force of 200 kN. The breadth and effective depth of the beam are 300 mm and 600 mm, which are uniform throughout. The tension zone is reinforced with 4 nos. of 20 mm dia bars and concrete grade is M25. Design the shear reinforcement using Fe415 grade steel. 10
- (OR)**
- B Design a dog legged staircase for a building using M20 grade concrete and Fe.415 grade steel. The height between the floors is 3.0m. The effective span of a flight is 5.25 m including the two landings. The tread and rise of brick steps are 300mm and 150mm respectively. The unit weight of brick steps is  $19\text{KN/m}^3$ . The imposed load is  $3\text{KN/m}^2$ . The flight slab is simply supported at their ends and their sides are not embedded in to the wall. Uniform loading may be assumed for the full span. 10
- 20 A Design a short square column using M25 grade concrete and Fe500 Steel to carry an axial load of 1800kN, by limit state method. 10
- (OR)**
- B Design a square footing of uniform thickness for a RC Column carrying an axial load of 1500 KN. Size of column is 400 mm × 400 mm. Safe bearing capacity of soil is  $150\text{KN/m}^2$ . Use M20 grade concrete and Fe 415 grade steel. Check for shear not required. 10
- 21 A A Laterally restrained simple beam has to resist a maximum bending moment of 180kNm. The yield strength of steel is  $250\text{N/mm}^2$ . Choose a suitable I-Section for the beam. 10
- (OR)**
- B Select a suitable single angle section to carry an axial tension of 240KN, due to DL and IL. The member has to be connected to gusset plates at its ends by fillet welds through one leg. The yield and ultimate strengths of steel are  $250\text{ N/mm}^2$  and  $400\text{N/mm}^2$ . Connection need not be designed. 10

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## PART-A

(5 x 2 = 10 Marks)

**Note: (i) Answer any FIVE questions out of which question No.8 is compulsory.****(ii) All questions carry equal marks.**

- 1 Define Architects.
- 2 Define normal services.
- 3 What is schedule of fees?
- 4 What is COA?
- 5 Define Arbitration.
- 6 What are the types of contract?
- 7 Define critical path.
- 8 What are the classifications of Banks?

## PART-B

(5 x 3 = 15 Marks)

**Note: (i) Answer any FIVE questions out of which question No. 16 is compulsory.****(ii) All questions carry equal marks.**

- 9 What are the various stages for the fees collection?
- 10 Write any three professional code of conduct.
- 11 Define contract. What are the various forms of contracts?
- 12 Compare CPM and PERT.
- 13 What are the types of float?
- 14 What are the types of cheque?
- 15 Define ATM & Pass Book.
- 16 What is building Insurance Scheme?

## PART-C

(5 x 10 = 50 Marks)

**Note: (i) Answer all the questions choosing either sub-division (A) or sub-division (B) of each question.****(ii) All divisions carry equal marks.**

- 17 A Explain in detail the role of an architect in the planning and execution of project. 10  
(OR)  
B Calculate the schedule of fees for a School building costing Rs. 60,00,000/- 10
- 18 A Explain the salient features of architectural act 1972. 10  
(OR)  
B Explain the role of the following: 10  
i) Council of Architecture India.  
ii) Indian Institute of Architects.
- 19 A What is contract? What are the types of contract? Explain briefly. 10  
(OR)  
B Explain the following: 10  
i) Articles of agreement in Contract  
ii) Recording of measurements in M – book
- 20 A Enumerate the advantages and disadvantages of CPM and PERT networks. 10  
(OR)  
B A construction project involves the following activities. Draw the network diagram. 10  
Mark the critical path. What is the project time?

Activity	1-2	1-3	2-4	2-5	4-7	5-7	7-8	3-6	6-8
Duration (days)	5	10	1	6	12	3	4	7	6

- 21 A Explain the different types of banks. 10  
(OR)  
B Write the formalities related to avail a housing loan from a government authorized bank. 10

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DIPLOMA IN ARCHITECTURAL ASSISTANTSHIP

Town Planning

Year/Sem: III / VI (EVEN-III)

Max. Marks : 75

Time : 3 hr.

**PART-A****(5 x 2 = 10 Marks)****Note: (i) Answer any FIVE questions out of which question No.8 is compulsory.****(ii) All questions carry equal marks.**

- 1 Mention the types of survey.
- 2 What is land-use planning?
- 3 What are the causes of slums?
- 4 What is landscape architecture?
- 5 List the classification of urban roads.
- 6 What are the objects of by-laws?
- 7 What is the function of green belts?
- 8 Expand HUDCO & CIDCO.

**PART-B****(5 x 3 = 15 Marks)****Note: (i) Answer any FIVE questions out of which question No. 16 is compulsory.****(ii) All questions carry equal marks.**

- 9 Write the necessity of town planning.
- 10 List the advantages of zoning.
- 11 Write about open plot scheme.
- 12 Write about garden city. Give one example.
- 13 Write about the types of recreation.
- 14 Write about freeways.
- 15 Write about floor space index and its importance.
- 16 Write about town center.

**PART-C****(5 x 10 = 50 Marks)****Note: (i) Answer all the questions choosing either sub-division (A) or sub-division (B) of each question.****(ii) All divisions carry equal marks.**

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|----|---|---|----|
| 17 | A | Explain in detail the necessity, principles and origin of town planning.                                  | 10 |
|    |   | <b>(OR)</b>   |    |
|    | B | Choose ideal site for a town. Explain the requirements of new towns.                                      | 10 |
| 18 | A | Explain the classification of residential buildings and write about rural housing.                        | 10 |
|    |   | <b>(OR)</b>   |    |
|    | B | What are the necessary ways to prevent the formation of slums? Write about slum clearance and rehousing.  | 10 |
| 19 | A | Explain in detail the classification of parks. Give examples.   | 10 |
|    |   | <b>(OR)</b>   |    |
|    | B | What are the necessities of master plan? What are the data to be collected in preparing the layouts?      | 10 |
| 20 | A | Mention the requirements of good city road. What are the factors to be considered while laying the roads? | 10 |
|    |   | <b>(OR)</b>   |    |
|    | B | Explain the traffic problems of existing towns. Give example.   | 10 |
| 21 | A | Write about i. off-street parking      ii) DCR      iii. Fire protection                                  | 10 |
|    |   | <b>(OR)</b>   |    |
|    | B | Explain in detail about site selection while designing an Airport.  | 10 |