Total No. of Printed Pages—8

GB/M–06–8B

CIVIL ENGINEERING 2006

SECOND PAPER

Full Marks : 200

Time : 3 hours

A candidate shall answer questions only from *any* **two** Parts

PART—A

(Building Construction)

Answer *any* **ten** questions

Each question carries 10 marks

1. To find the suitability of stones under different conditions, explain the characteristics of good building stones.

2. "White ants are strong enemy of timber." Describe any method of protecting timber from white ants.

3. What are the conventional classifications of bricks? Write the characteristics of a first-class brick.

4. What is a cement mortar? What are the functions of mortar? Briefly explain hand mixing of mortar.

5. What are the functions of sand in mortar? List the properties of good sand.

6. What is concrete? Write the advantages and disadvantages of concrete.

7. What are the functions of paint? What are the general precautions to be taken in process of painting?

8. Mention the different types of varnishes and describe the process of varnishing on woodwork.

9. What are laminated plastics? State their properties and uses.

10. What are the basic requirements to be fulfilled by a partition wall? Explain with neat sketch the glass sheet partition wall.

11. Explain the methods of brick flooring and marble flooring.

12. Mention the general specifications regarding construction and workmanship of wooden frames set by IS code.

13. What do you understand by total float? How is it determined? What is its importance in network planning?

(Continued)

PART—B

(Railways and Highways Engineering)

Answer *any* **ten** questions

Each question carries 10 marks

14. What are the important factors on the basis of which roads can be classified? Briefly describe the different categories of road mentioned in Nagpur plan Indian roads.

15. What are the factors that influence the highway alignment? Under what circumstances the above factors may be deviated?

16. What is gradient? Differentiate between maximum and ruling gradient. What values have been recommended by IRC?

17. Draw a neat sketch of a flexible pavement cross-section and show its different component parts. Write the functions of base course in case of rigid pavements.

18. Describe CBR method of pavement design. Discuss its merits and demerits.

19. What are the various steps involved in the traffic accident studies? Write the items with very short description, those are involved in collection of accident data.

20. Are traffic signals essential preventive measures for accident? Write the advantages and disadvantages of traffic signals.

21. Name the component which is transversely used for a railway track to give stiffness to railway tracks. What are the functions of this component?

22. Give the reason why ballast is not spread over sleepers. Draw a neat sketch to show the width and depth of ballast section for a BG track.

23. Name the characteristics for ideal fastening of railway track.

24. Find out the superelevation to be provided for 4° BG transitioned curve. The maximum speed limit is 110 km/hour.

25. What is a ruling gradient? Why is it necessary to bend rails on curves?

26. What is a marshalling yard? What are the points to be considered at the time of design of marshalling yard?

27. Explain with neat sketches—

    (a) scissors cross-over;

    (b) compensators.

PART—C

(Water Resources Engineering)

Answer *any* **ten** questions

Each question carries 10 marks

28. What do you understand by precipitation? Write the various forms of precipitations.

29. What do you understand by infiltration index? How do you determine it?

30. A field channel has culturable commanded area of 2000 hectares. The intensity of irrigation for gram is 30% and for wheat is 50%. Gram has a kor period of 18 days and kor depth of 12 cm, while wheat has a kor period of 15 days and kor depth of 15 cm. Calculate the discharge of the field channel.

31. Distinguish clearly between a shallow well and a deep well. How does a deep well differ from a tube-well in confined aquifer?

32. During a recuperation test, the water in open well was depressed by pumping by 2 m and it recuperated 1·5 m in 1 hour. Estimate the yield from a well of 2 m diameter under a depression head of 2 m situated in the same area.

33. What do you understand by mass inflow curve and how is it prepared? How can reservoir be calculated for a specified yield, from the mass inflow curve?

34. What is canal alignment for irrigation scheme? Explain clearly how ridge canal can suitably be used for irrigation purpose.

35. Mention the points of design considerations for inundation canal. What are the disadvantages of inundation canal?

36. Compare Kennedy's and Lacey's theory. Write the defects in Lacey's theory.

37. What are the causes of waterlogging? Write the requirements of good lining materials.

38. What is level crossing? What is meant by bank connections? How are they designed?

39. River training work is essential to control a river. Establish it. Explain with neat sketch repelling groyne.

40. Discuss with illustrations the physical factors that govern the selection of type of dam.

41. What are the functions of a spillway? Derive the expression for discharge through a saddle siphon spillway.

PART—D

(Sanitations and Water Supply)

Answer *any* **ten** questions

Each question carries 10 marks

42. What is design period in designing water supply scheme? What are the various factors which directly affect the per capita demand of a town?

43. What is water-bearing strata? Describe a dug-well with the help of a neat sketch.

44. Write the circumstances under which pumping of drinking water is required. What are the advantages of centrifugal pump?

45. Explain with the help of neat sketch the direct intake from a river.

46. Why is biological examination of water essential? Explain how it is done.

47. Write a detailed note on design and working of a continuous flow-type sedimentation tank. What reduction in turbidity do you expect in a properly working tank?

48. What is meant by hardness of water? Describe the procedure of lime-soda process of water softening.

49. What are the principles involved in the orientation of buildings in India? What are the characteristics of good ventilating system?

50. What is 'separate system' of sewerage? When is it necessary and useful to employ separate system of sewerage?

51. Explain the necessity of providing manhole in sewer line. Explain the construction of a manhole with the help of neat sketches.

52. Explain the significance of gully trap and antisiphon pipe. Use neat sketches.

53. What do you understand by sewage sickness? How can it be prevented?

54. What is a grit chamber? Why is it necessary to provide grit chamber in sewage treatment plants for combined sewage system?

55. Under what circumstances septic tanks are most suitable? Write the precautionary measures to be taken while doing plumbing works.

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