

28/AE/CME/M-2022-6

Booklet Series

Candidate's Roll Number

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B

Serial No.

201392

Question Booklet

Paper—VI

CIVIL ENGINEERING

Time Allowed : 1 Hour

(Objective)

Maximum Marks : 100

Read the following instructions carefully before you begin to answer the questions.

IMPORTANT INSTRUCTIONS

1. This Question Booklet contains **50** questions in all.
2. **All** questions carry equal marks.
3. Attempt **all** questions.
4. **Immediately after commencement of the examination, you should check up your Question Booklet and ensure that the Question Booklet Series is printed on the top right-hand corner of the Booklet. The Booklet contains 8 printed pages and no page or question is missing or unprinted or torn or repeated. If you find any defect in this Booklet, get it replaced immediately by a complete Booklet of the same series.**
5. You must write your Roll Number in the space provided on the top of this page. Do not write anything else on the Question Booklet.
6. An Answer Sheet will be supplied to you separately by the Invigilator to mark the answers. **You must write your Name, Roll No. and other particulars on the first page of the Answer Sheet provided, failing which your Answer Sheet will not be evaluated.**
7. You will encode your **Roll Number** and the **Question Booklet Series A, B, C or D** as it is printed on the top right-hand corner of this Question Booklet with Black/Blue ballpoint pen in the space provided on **Page-2** of your Answer Sheet. **If you do not encode or fail to encode the correct series of your Question Booklet, your Answer Sheet will not be evaluated correctly.**
8. Questions and their responses are printed in English only in this Booklet. Each question comprises **four** responses—(A), (B), (C) and (D). You are to select **ONLY ONE** correct response and mark in your Answer Sheet. In case you feel that there are more than one correct response, mark the response which you consider the best. In any case, choose **ONLY ONE** response for each question. Your total marks will depend on the number of correct responses marked by you in the Answer Sheet.
9. In the Answer Sheet, there are **four** brackets—(A), (B), (C) and (D) against each question. To answer the questions you are to **mark with Black/Blue ballpoint pen ONLY ONE** bracket of your choice for each question. Select one response for each question in the Question Booklet and mark in the Answer Sheet. If you mark more than one answer for one question, the answer will be treated as wrong. **Any erasure or change is not allowed.**
10. You should not remove or tear off any sheet from the Question Booklet. You are not allowed to take this Question Booklet and the Answer Sheet out of the Examination Hall during the examination. **After the examination has concluded, you must hand over your Answer Sheet to the Invigilator.** Thereafter, you are permitted to take away the Question Booklet with you.
11. Failure to comply with any of the above instructions will render you liable to such action or penalty as the Commission may decide at their discretion.

SEAL

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- Which one of the following methods can be employed for plastic and rubber waste disposal?
 - Composting
 - Pyrolysis
 - Incineration
 - Sanitary landfill
 - A trickling filter is designed to remove
 - dissolved organic matter
 - colloidal solids
 - settleable solids
 - None of the above
 - BOD of a town is 25000 kg/day and BOD per capita per day is 50 gram. The population equivalent of the town is
 - 500000
 - 10000
 - 50000
 - 250000
 - The entry of foul-smelling gases into the house coming from the sewers can be prevented by
 - providing sufficient vent pipes in the plumbing system
 - exhaust fan
 - providing water seals for all the fixtures
 - providing water seals for all the fixtures and vent pipe in the plumbing system
 - The trap used for a water closet is called as
 - intercepting trap
 - anti-siphon trap
 - gully trap
 - P-trap
 - The unit in which both sedimentation and digestion processes of sludge take place simultaneously is
 - digestion tank
 - detritus tank
 - Imhoff tank
 - skimming tank
 - High COD to BOD ratio of an organic pollutant represents
 - high biodegradability of the pollutant
 - low biodegradability of the pollutant
 - presence of toxic material in the pollutant
 - None of the above
 - Water is known as acidic water if the pH is
 - less than 5.5
 - less than 6.5
 - less than 6.0
 - All of the above

16. If the specific yield of a particular sand is 30% and its porosity is 50%, then the specific retention of the sand will be
(A) 20%
(B) 80%
(C) 55%
(D) 40%
17. According to Lacey's theory, the silt supporting eddies are generated from
(A) sides as well as bottom of channel
(B) sides of channel only
(C) bottom of channel only
(D) None of the above
18. Garret's diagram is based on
(A) Khosla's theory
(B) Kennedy's theory
(C) Lacey's theory
(D) None of the above
19. If a stream is carrying a discharge of 4.0 cumec per meter width having a silt factor 2.0, then the Lacey's scour depth will be
(A) 10.8 m
(B) 1.35 m
(C) 2.7 m
(D) 5.4 m
20. Trap efficiency of reservoir is a function of
(A) outflow/inflow ratio
(B) capacity/outflow ratio
(C) capacity/inflow ratio
(D) None of the above
21. When the reservoir is full, the maximum compressive force in a gravity dam is produced
(A) at the centre of base
(B) at the toe
(C) at the heel
(D) within the middle third of base
22. The elementary profile of a dam is
(A) a right-angled triangle
(B) a rectangle
(C) a trapezoid
(D) an equilateral triangle
23. A river training work is generally required when the river is
(A) both aggrading type and degrading type
(B) aggrading type
(C) degrading type
(D) meandering type
24. The maximum permissible eccentricity for no tension at the base of a gravity dam is
(A) $B/6$
(B) $B/2$
(C) $B/3$
(D) $B/4$
25. A hyetograph is a graphical representation of
(A) cumulative rainfall and time
(B) rainfall intensity and time
(C) rainfall depth and time
(D) discharge and time

26. A mass curve of rainfall is a plot of

- (A) the accumulated precipitation against time
- (B) the maximum intensity of rainfall against time
- (C) the intensity of rainfall against time
- (D) None of the above

27. The relationship between Manning's coefficient and Chezy's coefficient is given by

- (A) $C = \frac{1}{n} R^{2/3}$
- (B) $C = \frac{1}{n} R^{1/3}$
- (C) $C = \frac{1}{n} R^{1/4}$
- (D) $C = \frac{1}{n} R^{1/6}$

28. In a rectangular channel, the alternate depths are 1.5 m and 2.5 m respectively. The specific energy head (in meter) is

- (A) 3.06
- (B) 4.48
- (C) 3.35
- (D) 3.26

29. A rectangular channel has a bottom width of 2 m and longitudinal slope of the channel is 0.0003. What will be the average shear stress on the channel boundary when the flow takes place at a uniform depth of 1.25 m? (Take $\gamma = 10 \text{ kN/m}^3$)

- (A) 1.66 N/m^2
- (B) 16.66 N/m^2
- (C) 10.66 N/m^2
- (D) 2.66 N/m^2

30. In a triangular channel having a side slope of 2 horizontal : 1 vertical, the Froude number is given by

- (A) $2v/\sqrt{gy}$
- (B) v/\sqrt{gy}
- (C) $v/\sqrt{2gy}$
- (D) $v/\sqrt{gy/2}$

31. For a given specific energy E , the critical depth y_c for a rectangular channel is given by

- (A) $y_c = \frac{3}{4}E$
- (B) $y_c = \frac{3}{2}E$
- (C) $y_c = \frac{2}{3}E$
- (D) $y_c = \frac{4}{5}E$

32. A 3.0 m wide rectangular channel flowing at its normal depth of 0.8 m carries a discharge of 9.5 cumec. The bed slope of the channel is

- (A) adverse
- (B) mild
- (C) steep
- (D) critical

41. The maximum width of a vehicle as recommended by IRC is
- (A) 3.41 m
 - (B) 2.44 m
 - (C) 2.75 m
 - (D) 3.0 m
42. Desire lines are plotted in
- (A) accident studies
 - (B) traffic volume studies
 - (C) origin and destination studies
 - (D) speed studies
43. Which of the following is known as design capacity?
- (A) Possible capacity
 - (B) Theoretical capacity
 - (C) Basic capacity
 - (D) Practical capacity
44. Los Angeles testing machine is used to conduct
- (A) abrasion test
 - (B) crushing strength test
 - (C) impact test
 - (D) attrition test
45. Penetration test on bitumen is used for determining its
- (A) temperature susceptibility
 - (B) grade
 - (C) ductility
 - (D) viscosity
46. For carrying out bituminous patchwork during the rainy season, the most suitable binder is
- (A) cutback bitumen
 - (B) hot bitumen
 - (C) road tar
 - (D) bituminous emulsion
47. Which of the following is **not** water-borne disease?
- (A) Cholera
 - (B) Typhoid
 - (C) Malaria
 - (D) Dysentery
48. The maximum permissible limit of fluoride in drinking water is
- (A) 2.0 ppm
 - (B) 0.5 ppm
 - (C) 1.0 ppm
 - (D) 1.5 ppm
49. Turbidity is measured on
- (A) platinum-cobalt scale
 - (B) standard cobalt scale
 - (C) standard silica scale
 - (D) standard platinum scale
50. The maximum efficiency of BOD removal is achieved in
- (A) aerated lagoons
 - (B) oxidation pond
 - (C) trickling filters
 - (D) oxidation ditch

SPACE FOR ROUGH WORK

41. The maximum width as recommended by IRC is

- (A) 8.4 m
- (B) 8.4 m
- (C) 2.5 m
- (D) 2.0 m

- (A) attack pattern
- (B) hot pattern
- (C) road bar
- (D) the minimum emission

44. Which of the following water-borne diseases

- (A) Cholera
- (B) Typhoid
- (C) Malaria
- (D) Dysentery



48. The maximum permissible flow or discharge in drainage water is

- (A) 50 gpm
- (B) 0.5 gpm
- (C) 10 gpm
- (D) 1.5 gpm

49. Turbidity is measured on

- (A) platinum-cobalt scale
- (B) standard color scale
- (C) standard efflu scale
- (D) standard platinum scale

50. The maximum efficiency of BOD removal is achieved at

- (A) acclimated sludge
- (B) oxidation pond
- (C) trickling filter
- (D) oxidation ditch

SEAL