DO NOT OPEN THIS BOOKLET UNTIL YOU ARE ASKED TO DO SO.

PRELIMINARY SCREENING
TEST BOOKLET

TEST BOOKLET SERIES

A

Time allowed : $1\frac{1}{2}$ hours

Full marks : 100

Answer *all* the questions.

Questions are of equal value.

Serial No. ....**0241**.........

Roll No.:

Signature of the Candidate:

INSTRUCTIONS

Candidates should read the following instructions carefully before answering the questions:

1. This booklet consists of 16 pages including this front page, containing 100 questions. **Verify the Page Nos. and Test Booklet series on each page and bring at once to the Invigilator's notice any discrepancy.**

2. Answers will have to be given in the OMR Sheet supplied for the purpose.

3. Before you proceed to mark in the OMR Sheet in response to various items in the Test Booklet, you have to fill in some particulars in the OMR Sheet. *Do not fold the OMR Sheet as this will result in error in your marks.*

4. All questions are of multiple-choice answer-type. You will find *four* probable answers (A), (B), (C) and (D) against each question. Find out which of the four answers appears to you to be correct or the best. Now darken the circle corresponding to the letter of the selected answer in the OMR Sheet with **Black Ball Point Pen.**

5. One and only one circle is to be fully blackened for answer. Any spot in any other circle (multiple circle) or in wrong circle will be considered as wrong answer. If more than one circle is encoded for a particular answer, it will be treated as a wrong answer. Use of whitener is strictly prohibited.

6. *There will be negative marking of $\frac{1}{3}$ mark for each wrong answer.*

7. *There are blank pages at the end of this Booklet for Rough Work.*

8. *The OMR Sheet should be handed over to the Invigilator before leaving the Examination Hall. You are permitted to take away the used Test Booklet after completion of the examination.*

1. What angle of orbit used in a satellite deployment GPS SVs with the equator?

(A) 50°

(B) 55°

(C) 60°

(D) 65°

2. Fill in the blank with appropriate preposition:

　　The imposter tried to pass himself_____ as a police officer.

(A) away

(B) off

(C) up

(D) on

3. For a sphere of radius 15 cm moving with a uniform velocity of 2 m/sec through a liquid of specific gravity 0·9 and dynamic viscosity 0·8 Poise, then the Reynolds number will be

(A) 375

(B) 425

(C) 550

(D) 675

4. She has decided to become a Scientist like her father. She is

(A) all ears

(B) an Achilles' heel

(C) a chip of the old block

(D) a piece of cake

5. Hydrodynamic pressure due to earthquake acts at a height of

(A) $\dfrac{3H}{4\pi}$ above the base

(B) $\dfrac{3H}{4\pi}$ below the water surface

(C) $\dfrac{4H}{3\pi}$ above the base

(D) $\dfrac{4H}{3\pi}$ below the water surface

where H is the depth of water.

6. The rainfall on five successive days were measured as 100 mm, 80 mm, 60 mm, 40 mm and 20 mm respectively. If the infiltration index or the storm loss rate for the catchment area is earlier estimated as 50 mm/day, the total surface run off will be

(A) 50 mm

(B) 60 mm

(C) 90 mm

(D) 140 mm

7. In a flow net diagram, the length of the flow net line in the last is 2·0 m, the total head loss is 18·0 m and the number of potential drops is 12·0. Then the value of exit gradient is

(A) 0·33

(B) 0·75

(C) 1·33

(D) 3·0

8. Select the most appropriate Antonym of 'Embellish':

(A) Ameliorate

(B) Disfigure

(C) Berate

(D) Attenuate

9. A hydraulic turbine has a discharge of 5 m³/sec, when operating under a head 20·0 m with a speed of 500 rpm. If it is to be operate under a head of 15·0 m with same discharge, the rotational speed in rpm will be

(A) 433

(B) 403

(C) 627

(D) 388

10. If the volume of voids is equal to the volume of solids in a soil mars, then the values of porosity and voids ratio are

(A) 1·0 and 0·0

(B) 0·0 and 1·0

(C) 0·5 and 1·0

(D) 1·0 and 0·5

11. From a reflectance–wavelength curves the range of wavelength of water is

(A) $0.4\,\mu m - 1.0\,\mu m$

(B) $0.5\,\mu m - 0.9\,\mu m$

(C) $0.4\,\mu m - 0.8\,\mu m$

(D) $0.4\,\mu m - 0.7\,\mu m$

12. Select the most important Antonym of 'Intrepid':

(A) Rapid

(B) Slow

(C) Courageous

(D) Cowardly

13. If D is the depth of scour below original bed, then the width of launching apron is

(A) $1.2\,D$

(B) $1.5\,D$

(C) $2.0\,D$

(D) $2.5\,D$

14. "For less exciting than originally expected to be". The idiom which upholds this expression is

(A) Snowball effect

(B) Couch potato

(C) Wet blanket

(D) Damp squib

15. Synonym of 'Adroit' is

(A) Adjustable

(B) Malevolent

(C) Clever

(D) Comfortable

16. A slope is to be constructed at an angle of 30° to the horizontal from a soil having the properties $C = 15$ kN/m², $\phi = 22.5°$, $\gamma = 1.9$ t/m³ Taylor's stability no. is 0.046. If factor of safety with respect to Cohesion of 1.5, then the safe height of slope will be

(A) 25.8 m

(B) 19.1 m

(C) 17.2 m

(D) 11.5 m

17. The Indian Constitution borrowed the idea of the Directive Principles of state policy from the Constitution of

(A) Australia

(B) Canada

(C) Ireland

(D) U.S.A.

18. The best shape of triangle be isoceles, having the base angles is

(A) 56°14′

(B) 56°12′

(C) 56°10′

(D) 56°8′

19. If an upgrade of 1.5% is followed by a down grade is 0.2% per 20 m chain, then the length of the vertical curve is

(A) 100 m

(B) 200 m

(C) 300 m

(D) 400 m

20. Which among the following is not a manufactured/processed fuel?

(A) Petrol

(B) Petroleum

(C) Diesel

(D) Kerosene

Please Turn Over

21. If the probable error in single observation is ± 0·04 m and that of the mean is ± 0·01 m then the number of observations are

    (A) 4
    (B) 10
    (C) 16
    (D) 64

22. Which of the following means "Something so subline that it cannot be described in words"?

    (A) Incorrigible
    (B) Ineffable
    (C) Indubitable
    (D) Incognito

23. If the shearing stress is zero on two planes, then the angle between the two plane is

    (A) 45°
    (B) 90°
    (C) 135°
    (D) 225°

24. Which Article of the Indian Constitution mentions about the President of Inida?

    (A) Article 52
    (B) Article 53
    (C) Article 61
    (D) Article 54

25. Agonic line is the line joining points having

    (A) zero declination
    (B) minimum declination
    (C) maximum declination
    (D) same declination

26. If RL's of canal bed level and high flood level of drainage are 212·0 m and 210·0 m respectively, then the cross drainage work will be

    (A) aqueduct
    (B) superpassage
    (C) syphon
    (D) syphon aqueduct

27. Fill in the blank with appropriate preposition:

The businessman deals _____ electronic goods.

    (A) in
    (B) with
    (C) off
    (D) about

28. The primary colors range of blue, green and red are composed of wavelengths from about

    (A) 0·4 to 0·5 μm
    (B) 0·5 to 0·6 μm
    (C) 0·6 to 0·7 μm
    (D) 0·4 to 0·7 μm

29. Which of the following falls under the category of a Utility Software?

    (A) Antivirus Software
    (B) Backup Software
    (C) Disk Tools
    (D) All of the above

30. The intensity of pressure developed by surface tension of 0·075 N/m in a droplet of water of 0·075 mm diameter is

    (A) 0·8 N/cm^2
    (B) 0·6 N/cm^2
    (C) 0·4 N/cm^2
    (D) 0·2 N/cm^2

31. Indentify the sentence which is grammatically correct:

    (A) We discussed about the matter yesterday.

    (B) Kindly return back my book immediately.

    (C) She requested my help.

    (D) We could not find the ball nowhere.

32. North Atlantic Treaty Organization (NATO) was signed in the year

    (A) 1946

    (B) 1948

    (C) 1949

    (D) 1950

33. For a vertical photograph taken from a aircraft the image motion (IM) of such photograph is obtained as

    (A) $IM = \dfrac{fH}{V}$

    (B) $IM = fVH$

    (C) $IM = \dfrac{fV}{H}$

    (D) $IM = \dfrac{fH}{V}$

where f = focal length of lens, H = height of aircraft above ground, V = velocity of aircraft.

34. Identify the word with the correct spelling:

    (A) Indispensable

    (B) Indispensible

    (C) Indisspensable

    (D) Indisspensible

35. A tree was found to have 0·5 mm parallax difference the flying height being 2500 mm. If the absolute parallax of the base of tree is 99·5 mm, then the height of tree is

    (A) 6·25 m

    (B) 12·5 m

    (C) 25·0 m

    (D) 8·0 m

36. The Exposure (E) is a measure of light energy received at any point on the film is exposed given by

    (A) $E = \dfrac{sd^2 t}{4f}$

    (B) $E = \dfrac{sdt}{4f}$

    (C) $E = \dfrac{sd^2 t^2}{4f^2}$

    (D) $E = \dfrac{s^2 d^2 t}{4f^2}$

where f = lens focal length, s = brightness of the object, d = diameter of lens opening, t = time of exposure.

37. The curve showing intensity of light emitted or reflected by the objects at different wavelengths is called

    (A) Reflectance curve

    (B) Spectral response curve

    (C) Wavelength response curve

    (D) Electromagnetic wave curve

38. Identify which part of the given sentence has an error:

    Everyone except the Germans want the ban lifted.

    (A) except the Germans

    (B) want

    (C) the ban

    (D) No error

39. The Side-Looking Airborne Radar (SLAR) provides images as

    (A) Vertical views

    (B) Oblique views

    (C) Tilted views

    (D) Rotating views

Please Turn Over

40. Identify the word with the correct spelling:

(A) Ocassion

(B) Occassion

(C) Occasion

(D) Occation

41. In stereoscopic photograph, K, horizontal overlap 60%, ω = lateral overlap 20%, area cover 30 km × 20 km with photoformat 230 mm × 230 mm, then the no. of photographs is

(A) 1080

(B) 540

(C) 108

(D) 1040

42. Which of the following Five Year Plans in India focused on the concept of Human Development?

(A) Eighth Plan

(B) Ninth Plan

(C) Tenth Plan

(D) Eleventh Plan

43. For a photographic camera if 'd' diameter of camera opening, f = focal length of lens, then the f-stop will be

(A) $\dfrac{d^2}{f^2}$

(B) $\dfrac{f^2}{d^2}$

(C) $\dfrac{d}{f}$

(D) $\dfrac{f}{d}$

44. For a given soil having properties is $C = 2\ t/m^2$, $\phi = 00$ and $\gamma = 2\ t/m^3$, then the depth of tension crack developing in Cohesive soil back fill would be

(A) 1·0 m

(B) 2·0 m

(C) 3·0 m

(D) 4·0 m

45. The ratio of pressure between two points A and B located respectively at depths 0·5 m and 2·0 m below a constant level of water in a tank is

(A) $1 : \sqrt{2}$

(B) $1 : 2$

(C) $1 : 4$

(D) $1 : 16$

46. If the degree of saturation of a partially saturated soil 60%, then the air content of the soil is

(A) 40%

(B) 60%

(C) 80%

(D) zero percentage

47. Which of the following velocity potentials satisfied (continuity) equation?

(A) $x^2 y$

(B) $x^2 - y^2$

(C) $\cos x$

(D) $x^2 + y^2$

48. A metallic tape is made of 'Invar' to linear measurements because for

(A) high linear expansion.

(B) low linear expansion.

(C) medium linear expansion.

(D) None of the above

49. If the time required for 50% consolidation of a remoulded sample of clay with single drainage is 't' then the time required to consolidate the same sample of clay with same degree of consolidation with double drainage is

(A) $\dfrac{t}{4}$

(B) $\dfrac{t}{2}$

(C) $2t$

(D) $4t$

50. For maximum discharge in a circular channel section, the ratio of the depth of flow to that of diameter of the channel is

(A) 0·30

(B) 0·50

(C) 0·81

(D) 0·95

51. In a photograph if $RF = \dfrac{1}{20,000}$, photo overlap 60%, photoformat 230 mm × 230 mm. Then the minimum number of stereoscopic photo of hand 30 km long is

(A) 15

(B) 16

(C) 17

(D) 18·0

52. Shear strength of a soil is a unique function of

(A) effective stress only.

(B) total stress only.

(C) both effective stress and total stress.

(D) None of the above

53. If an infinite slope of clay at a depth 5·0 m has Cohesion of 1.0 t/m² and unit wt of 2.0 t/m³, then the stability number will be

(A) 0·1

(B) 0·2

(C) 0·3

(D) 0·4

54. Fill in the blank with appropriate word:

Unless we pull ourselves _____, we will not be able to win the war.

(A) down

(B) together

(C) in

(D) over

55. The size of a plane lable is

(A) 750 mm × 900 mm

(B) 600 mm × 750 mm

(C) 450 mm × 650 mm

(D) 600 mm × 900 mm

56. Choose the correct alternative:

He succeeded _____ his merit and hard work.

(A) in spite of

(B) by dint of

(C) with regard to

(D) in reference to

57. The co-efficient of active earth pressure is for a loose sand having an angle of internal friction

(A) $\dfrac{1}{3}$

(B) 1·0

(C) 3·0

(D) 9·0

58. The hydraulic head that would produce a quick sand condition in a sand stratum of thickness 1·5 m, specific gravity is 2·67 and void ratio is 0·67 is equal to

(A) 1·0 m

(B) 1·5 m

(C) 2·0 m

(D) 3·0 m

Please Turn Over

59. Which among the following is the Tributary of the Mayurakshi river in West Bengal?

    (A) Mundeshwari

    (B) Kangsabati

    (C) Kumari

    (D) Bakreshwar

60. When the degree of consolidation is 50%, then the time factor is

    (A) 0·2

    (B) 0·5

    (C) 1·0

    (D) 2·0

61. Two small orifices A and B of diameters 1 cm and 2 cm respectively, are placed on the sides of a tank at depths h_1 and h_2 below the open liquid surface. If the discharges through A and B are equal, then the ratio of h_1 and h_2 (assuming equal C_α values) will be

    (A) 16 : 1

    (B) 8 : 1

    (C) 4 : 1

    (D) 2 : 1

62. Under a given load, a clay layer attains 30% degree of consolidation in 100 days. The time taken by the same clay layer to attain 60% degree of consolidation will be

    (A) 1600 days

    (B) 800 days

    (C) 400 days

    (D) 200 days

63. The depth of water required to bring the soil moisture content of a given soil up to its field capacity is called

    (A) hygroscopic water

    (B) equivalent moisture

    (C) soil moisture deficiency

    (D) pellicular water

64. The relation between duty 'D' in hectares cumec, depth of water 'Δ' in meters and base period 'B' in days is given by

    (A) $\Delta = 6{\cdot}54\dfrac{B}{D}$

    (B) $\Delta = 8{\cdot}64\dfrac{B}{D}$

    (C) $\Delta = 6{\cdot}54\dfrac{D}{B}$

    (D) $\Delta = 8{\cdot}64\dfrac{D}{B}$

65. In a stereoscopic photograph, if $K = 60\%$ overlap RF of the photographs 1/15000 and w = width of photo is 20·0 mm, then the airbase B of the photograph is

    (A) 2·4 km

    (B) 1·2 km

    (C) 0·6 km

    (D) 0·3 km

66. A person who knows many languages is called a

    (A) Polyglot

    (B) Polymorph

    (C) Polymath

    (D) Polyandrist

67. A soil having specific gravity is 2·704 and void ratio is 0·42, then the critical hydraulic gradient of soil is

    (A) 1·2

    (B) 2·6

    (C) 4·06

    (D) 8·9

68. A triangular channel section is most economical when each of its slopping sides is inclined to the vertical at an angle of

    (A) 30°

    (B) 45°

    (C) 60°

    (D) 75°

69. Choose the correct alternative:

The garrison held _____ for a month before surrendering finally.

    (A) out

    (B) over

    (C) up

    (D) down

70. If a camera d_1 is aperture and A_1 is the aperture area, then what will be diameter of a camera whose aperture is half of first camera?

    (A) $2 \cdot 0 \, d_1$

    (B) $\frac{1}{2} d_1$

    (C) $\frac{d_1}{\sqrt{2}}$

    (D) $\frac{d_1}{4 \cdot 0}$

71. In which year was the Wildlife (Protection) Act of 1972 in India amended?

    (A) 1989

    (B) 1990

    (C) 1991

    (D) 1992

72. A channel designed by Lacey's theory has a mean velocity $1 \cdot 0$ m/sec. The silt factor is unity. Then the hydraulic mean radius will be

    (A) $2 \cdot 5$ m

    (B) $2 \cdot 0$ m

    (C) $1 \cdot 0$ m

    (D) $0 \cdot 5$ m

73. Who among the following was the founder of Prarthana Samaj in 1867?

    (A) Govind Ranade

    (B) R.G. Bhandarkar

    (C) Atmaram Pandurang

    (D) Keshab Chandra Sen

74. The minimum diameter of turning basin, where ship turn by going ahead and without tug assistance should be

    (A) $1 \cdot 0 L$

    (B) $1 \cdot 5 L$

    (C) $2 \cdot 0 L$

    (D) $4 \cdot 0 L$

where L is the length of the largest ship.

75. Each point in the image or scene is represented by an integer digital number (DN), the range of DN values being normally

    (A) $0 - 200$

    (B) $0 - 220$

    (C) $0 - 245$

    (D) $0 - 255$

76. Total force due to wave action on a gravity dam acts at height above the reservoir surface —

    (A) $\frac{h_w}{2}$

    (B) $\frac{5}{4} h_w$

    (C) $\frac{3}{8} h_w$

    (D) $\frac{2}{3} h_w$

where h_w = height of wave.

77. A fluid of kinematic viscosity 0·4 cm²/sec flows through a 8 cm diameter pipe. The maximum velocity for laminar flow will be

(A) less than 1 m/sec

(B) 1 m/sec

(C) 1·5 m/sec

(D) 2 m/sec

78. The percentage of carbon content in mild steel is

(A) less than 0·25

(B) 0·25 to 0·7

(C) 0·7 to 1·5

(D) greater than 1·5

79. The magnitude of the component of velocity at point $(1, 1)$ for a stream function $\psi = x^2 - y^2$ is equal to

(A) $\sqrt{2}$

(B) 2

(C) $2\sqrt{2}$

(D) 4

80. If the cross-sectional area of an embankment of 30 m intervals are 20, 40, 60, 50 and 30 m² respectively. Then the volume of the embankment as per Prismoidal rule is

(A) 5300 m³

(B) 5800 m³

(C) 530 m³

(D) 5325 m³

81. Identify which part of the given sentence has an error:

The attendance registrar is missing from the classroom.

(A) attendance

(B) registrar

(C) from

(D) No error

82. If the RL of a BM is 100·0 m, the back-sight is 1·215 m and fore-sight is 1·870 m, then the RL of the Forward Station is

(A) 99·345 m

(B) 100·345 m

(C) 100·655 m

(D) 101·870 m

83. In steady laminar flow of liquid through a circular pipe of internal diameter D, carrying a constant discharge, the hydraulic gradient is inversely proportional to

(A) D

(B) D^2

(C) D^4

(D) D^5

84. For medium silt whose average grain size is 0·16 mm. Then Lacey's silt factor for such soil is

(A) 0·30

(B) 0·45

(C) 0·70

(D) 1·32

85. What is the tenure of the Judges of the International Court of Justice in the United Nations?

(A) 7 years

(B) 8 years

(C) 9 years

(D) 5 years

86. The peak of a 4-hours flood hydrograph is 240 m³/sec. If the rainfall excess is 80 mm and base flow is 40·0 m³/sec, then the peak of 4-hours unit hydrograph is

(A) 20 m³/sec

(B) 25 m³/sec

(C) 30 m³/sec

(D) 35 m³/sec

87. The man is guilty of murdering his own wife. The man has committed

(A) Matricide

(B) Wifocide

(C) Uxoricide

(D) Sororicide

88. The flow net for an earthen dam with 30·0 m water depth consists of 25 potential drops and 5 flow channels. The co-efficient of permeability of dam material is 0·03 mm/sec. Then the discharge of dam per meter length is

(A) 0·00018 m³/sec

(B) 0·0045 m³/sec

(C) 0·18 m³/sec

(D) 0·1125 m³/sec

89. Identify the odd word among the following alternatives:

(A) Pacific

(B) Bellicose

(C) Belligerent

(D) Cantankerous

90. When the plastic limit of a soil greater than the liquid limit, then the plasticity index of soil—

(A) negative

(B) zero

(C) non-plastic (NP)

(D) 1·0

91. If the radius of circular curve is five times the length of the transition curve, then the spiral angle is given by

(A) $\frac{1}{5}$ radian

(B) $\frac{1}{10}$ radian

(C) $\frac{1}{20}$ radian

(D) $\frac{1}{40}$ radian

92. 'To have a blast' means

(A) To enjoy

(B) To be injured

(C) To work in mines

(D) To engage in terrorist activities

93. The maximum permissible eccentricity for no tension at the base of the gravity dam is

(A) $\frac{B}{2}$

(B) $\frac{B}{3}$

(C) $\frac{B}{4}$

(D) $\frac{B}{6}$

where B is the width of dam.

94. Remote sensing practically come to mean data acquisition of electromagnetic radiation, a wavelength from sensors. The range of such wavelength is

(A) 0·4 μm – 2·6 cm

(B) 0·4 μm – 2·4 μm

(C) 0·4 μm – 30 cm

(D) 0·4 μm – 2·6 μm

Please Turn Over

95. If the true bearing of a line AB is 269°30′, then the azimuth of the line AB is

    (A) 0°30′

    (B) 89°30′

    (C) 90°30′

    (D) 269°30′

96. Dimensions of co-efficient of transmissibility are

    (A) $M^0L^0T^0$

    (B) $M^0L^1T^1$

    (C) $M^0L^2T^1$

    (D) $M^0L^3T^1$

97. The most suitable shape of well conditions triangle to minimise the error is

    (A) Equilateral

    (B) Obtuse triangle

    (C) Acute triangle

    (D) None of the above

98. The length of a pipe 1 km and its diameter is 20 cm. If a diameter of an equivalent pipe is 40 cm, then its length is

    (A) 32 km

    (B) 20 km

    (C) 8 km

    (D) 4 km

99. When a ship floats at its designed waterline, the vertical distance from waterline to the bottom of the ship is known as

    (A) beam

    (B) depth

    (C) freeboard

    (D) draft

100. For wave action in dams, the maximum height of freeboard is generally taken to be equal:

    (A) $0.5\,h_w$

    (B) $0.75\,h_w$

    (C) $1.25\,h_w$

    (D) $1.50\,h_w$

where h_w is the height of wave.