



Teachingninja.in



Latest Govt Job updates



Private Job updates



Free Mock tests available

Visit - teachingninja.in

MPSC JE

Previous Year Paper
(Civil)
01 Jun, 2024



DO NOT BREAK THE SEAL OF THE BOOKLET UNTIL YOU ARE TOLD TO DO SO

SERIES : IV

QUESTION BOOKLET

**Subjects : General English, General Knowledge and
Civil Engineering**

Full Marks : 300

Time Allowed : 2½ Hours

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

INSTRUCTIONS TO CANDIDATES

1. This Booklet contains 150 questions to be answered in a separate OMR Answer Sheet using Black Ballpoint Pen in the following three Parts :

Part—A : General English	: 25 questions
Part—B : General Knowledge	: 25 questions
Part—C : Civil Engineering	: 100 questions

2. All questions are compulsory.
3. You will be supplied the Answer Sheet separately by the Invigilator. You must complete the details of particulars asked for.
4. Answer must be shown by completely blackening the corresponding circle in the Answer Sheet against the relevant question number by Black Ballpoint Pen. OMR Answer Sheet without marking Series shall not be evaluated.

Example :

Suppose the following question is asked :

The Capital of Meghalaya is

- (A) Guwahati
(B) Kohima
(C) Shillong
(D) Delhi

You will have four alternatives in the Answer Sheet for your response corresponding to each question of the Question Booklet as below :

(A) (B) (C) (D)

In the above illustration, if your chosen response is alternative (C), i.e., Shillong, then the same should be marked on the Answer Sheet by blackening the relevant circle with a Black Ballpoint Pen only as below :

(A) (B) ● (D)

The example shown above is the only correct method of answering.

5. Answer the questions as quickly and as carefully as you can. Some questions may be difficult and others easy. Do not spend too much time on any one question.
6. There will NOT be any negative marking for wrong answers.
7. The Answer Sheet must be handed over to the Invigilator before you leave the Examination Hall.
8. No Rough Work is to be done on the Answer Sheet. Space for Rough Work has been provided in the Question Booklet.

PART—A : GENERAL ENGLISH

(Marks : 50)

Each question carries 2 marks

Directions : For the given underlined idioms, choose the best alternative which expresses the closest meaning of the idiom. Mark the correct answer in your answer sheet.

1. Riding a tricycle is such a breeze.
(A) EASY (B) BEST
(C) PAIN (D) SPORT
2. Her grandmother had a hell of a time trying to connect to the Internet.
(A) Chaotic time
(B) A difficult experience
(C) Fun time
(D) A splendid moment
3. A little bird told me that it is your birthday.
(A) A friendly call
(B) The messenger
(C) The swallow
(D) Someone told me a secret
4. I've got a lot on my plate tonight. I don't think I will finish until midnight.
(A) Hectic schedule
(B) Very busy
(C) Overdue
(D) Plenty of time
5. You have not said much. A penny for your thoughts.
(A) Ask for advice
(B) Ask for solution
(C) Seek answers
(D) I would like to know what you are thinking

Directions : In the following questions, substitute each phrase with a single word from among the alternatives given.

6. One who speaks many languages
(A) Polyglot
(B) Introvert
(C) Linguist
(D) Sociopath
7. To confirm with the help of evidence
(A) Philanthropist
(B) Bilingual
(C) Corroborate
(D) Refute
8. Lacking vigour or effectiveness
(A) Flaccid
(B) Placid
(C) Gluttonous
(D) Gregarious
9. Capable of being interpreted in two or more ways
(A) Definite
(B) Clear
(C) Ambiguous
(D) Explicit
10. One who doesn't consume any intoxicating drink
(A) Sadist
(B) Truant
(C) Teetotaler
(D) Volunteer

Directions : In the following questions, choose a word that is opposite in meaning to the given word from among the given alternatives. Mark the correct answer in your answer sheet.

11. Quiescent

- (A) Active
- (B) Dormant
- (C) Unconcerned
- (D) Weak

12. Belittle

- (A) Criticize
- (B) Flatter
- (C) Exaggerate
- (D) Previs

13. Fraudulent

- (A) Candid
- (B) Forthright
- (C) Direct
- (D) Genuine

14. Expand

- (A) Convert
- (B) Congest
- (C) Conclude
- (D) Contract

15. Exodus

- (A) Influx
- (B) Homecoming
- (C) Return
- (D) Restoration

Directions : In the following questions, choose a word that is most similar in meaning to the given word from among the given alternatives. Mark the correct answer in your answer sheet.

16. Catering

- (A) Considering
- (B) Supplying
- (C) Lending
- (D) Working

17. Aggressive

- (A) Violent
- (B) Determined
- (C) Offensive
- (D) Demanding

18. Key

- (A) Foundation
- (B) Solution
- (C) Requisite
- (D) Important

19. Instrumental

- (A) Responsible
- (B) Creditable
- (C) Reasonable
- (D) Liable

20. Educe

- (A) Exert
- (B) Educate
- (C) Extract
- (D) Extend

Directions : Read the following passage and answer the questions by selecting the correct answer from the alternatives given. Mark the correct answer in your answer sheet.

Motor vehicles run on either petrol or diesel, both of which are produced by refining petroleum, the thick, dark oil taken out from the depths of the earth. Petroleum is called a fossil fuel as it comes from fossils—the remains of animals and plants which lived on the earth millions of years ago and lie buried deep inside the earth.

The store of fossil fuels (mainly petroleum and coal) inside the earth is limited, since no more of these fuels is being produced now. Once the store is used up, we will not have any more petrol or diesel for our aeroplanes, cars, trucks and buses. Fossil fuel are therefore called non-renewable sources of energy.

As the store of fossil fuels is being used up very fast, scientists have been looking for alternative sources of energy. Fortunately, they have been able to produce fuel for diesel and petrol engines from plant sources. Scientists have learnt to convert the oil extracted from the seeds of soya beans into a liquid fuel which has been given the name 'bio-diesel'. Bio-diesel is also extracted from groundnuts, rape-seed oil and oil from a plant called jatropha. Unlike petroleum, fuel extracted from plants is a renewable source of energy. Once a plant has been harvested, another plant can grow in its place. Plants get their energy mainly from the sun, which is an unending source of energy.

It has been found that bio-diesel produces much less pollution than the fuels which are now being used in engines. It is generally mixed with diesel, in the ratio 1 : 4, but engines can be run on pure bio-diesel.

21. What are fossil fuels?
 - (A) Diesel
 - (B) Petrol
 - (C) Gas
 - (D) Remains of animal and plants
22. What is bio-diesel?
 - (A) Vegetable/animal fat-based diesel fuel
 - (B) Synthetic oil
 - (C) Lubricant oil
 - (D) Coolants
23. Which kind of fuel is likely to be used by motor vehicles in future?
 - (A) Carbon
 - (B) Bio-diesel
 - (C) Solar energy
 - (D) Soya oil
24. What are the advantages of bio-diesel?
 - (A) High conductivity
 - (B) Increased lubricity
 - (C) Emits less air pollutants and green-house gases
 - (D) Increased use of fertilizers
25. What is renewable source of energy?
 - (A) Energy sources that are always being replenished
 - (B) Geo-thermal energy
 - (C) A resource of economic value
 - (D) Gravity

PART—B : GENERAL KNOWLEDGE

(Marks : 50)

Each question carries 2 marks

26. By which name/names is our country mentioned in the Constitution?
- (A) India and Bharat
 - (B) India and Hindustan
 - (C) Bharat only
 - (D) Bharat, India and Hindustan
27. 'State is a necessary evil' is associated with
- (A) constructivism
 - (B) idealism
 - (C) Marxism
 - (D) individualism
28. The currency notes are printed in
- (A) Mumbai
 - (B) Nagpur
 - (C) New Delhi
 - (D) Nasik
29. The country without income tax is
- (A) Nepal
 - (B) Kuwait
 - (C) Burma
 - (D) Singapore
30. 1st December is celebrated as
- (A) Indian Navy Day
 - (B) UNICEF Day
 - (C) Children's Day
 - (D) World AIDS Day
31. What is the full form of PMSBY?
- (A) Pradhan Mantri Suraksha Bima Yojana
 - (B) Pradhan Mantri Sukanya Bima Yojana
 - (C) Pradhan Mantri Swachh Bharat Yojana
 - (D) None of the above
32. According to National Education Policy, 2020, vocational education will start from _____ with internships.
- (A) Class VII
 - (B) Class VIII
 - (C) Class VI
 - (D) Class V
33. Which country has become the first Gulf State to record a case of monkeypox?
- (A) Saudi Arabia
 - (B) UAE
 - (C) Qatar
 - (D) Oman
34. What is the theme of the 'Swachh Survekshan, 2023'?
- (A) Waste to Wealth
 - (B) Jan Bhagidari
 - (C) Waste Management
 - (D) Jan Andolan

35. Who among the following was popularly known as the Parrot of India?
- (A) Tansen
 - (B) Ibn Battuta
 - (C) Amir Khusrau
 - (D) Ziauddin Barani
36. Which one of the following countries has the maximum time difference from Greenwich Mean Time (GMT)?
- (A) India
 - (B) Nepal
 - (C) Sri Lanka
 - (D) Bhutan
37. Which of the following is an indirect tax in India?
- (A) Goods and services tax
 - (B) Income tax
 - (C) Corporation tax
 - (D) Capital gains tax
38. F stands for _____ in IFSC.
- (A) Fiscal
 - (B) Forex
 - (C) Foreign
 - (D) Financial
39. Which organization is setting up world's largest zoo in Jamnagar district of Gujarat?
- (A) Tata Industries
 - (B) Ministry of Tourism
 - (C) Reliance Industries
 - (D) Ministry of Animal Welfare
40. Tsunamis are not caused by
- (A) hurricanes
 - (B) earthquakes
 - (C) undersea landslides
 - (D) volcanic eruptions
41. Guwahati High Court is the judicature of
- (A) Assam
 - (B) Nagaland
 - (C) Arunachal Pradesh
 - (D) All of the above
42. Anthophobia is the fear of which of the following?
- (A) Boss
 - (B) Fire
 - (C) Flowers
 - (D) Dogs

43. The first metal to be used by man was
- (A) bronze
 - (B) iron
 - (C) copper
 - (D) stone
44. Who among the following was the first President of Pakistan?
- (A) Zulfikar Ali Bhutto
 - (B) Yahya Khan
 - (C) Iskander Ali Mirza
 - (D) Ayub Khan
45. Who wrote the book, *Ka Phan Nonglait*?
- (A) Daniel S. Lyngdoh
 - (B) Victor G. Bareh
 - (C) Rev. S. S. Majaw
 - (D) Ian Lyngdoh
46. Which country is comparable to the size of Meghalaya?
- (A) El Salvador
 - (B) Belize
 - (C) Bhutan
 - (D) Austria
47. What is the State Tree of Meghalaya?
- (A) Alder
 - (B) Agarwood
 - (C) Gamhar
 - (D) Uningthou
48. Name the soccer player from Meghalaya who was signed by RoundGlass Punjab FC.
- (A) Phrangki Buam
 - (B) Hardy Nongbri
 - (C) Samuel Shadap
 - (D) Samuel Kynshi
49. Name the State where population density is the lowest.
- (A) Meghalaya
 - (B) Arunachal Pradesh
 - (C) Mizoram
 - (D) Sikkim
50. How many countries share land boundaries with India?
- (A) Five
 - (B) Six
 - (C) Seven
 - (D) None of the above

PART—C : CIVIL ENGINEERING

(Marks : 200)

Each question carries 2 marks

51. The purpose of the end sill in the stilling basin of a hydraulic jump type energy dissipator is
- (A) to increase the tail water depth
 - (B) to reduce the length of jump and control scour
 - (C) to counteract the uplift on the floor
 - (D) to dissipate the energy by impact action
52. The usual size of suspended solids is
- (A) $> 100 \mu\text{m}$
 - (B) $< 1 \text{ mm}$ and $> 1 \mu\text{m}$
 - (C) $< 1 \mu\text{m}$ and $> 10^{-3} \mu\text{m}$
 - (D) $> 1 \mu\text{m}$ and $< 100 \mu\text{m}$
53. The pH of water sample containing 0.1008 g of H ion per litre is
- (A) 1
 - (B) 2
 - (C) 3
 - (D) 4
54. The pH range of mineral acidity is
- (A) < 4.5
 - (B) > 4.5 but < 8.3
 - (C) < 7
 - (D) > 8.3
55. The effluent of a biological treatment unit should have a BOD less than
- (A) 10 mg/l
 - (B) 30 mg/l
 - (C) 50 mg/l
 - (D) 0 mg/l
56. Lead in water causes
- (A) plumbo solvency
 - (B) stains on clothes and paper
 - (C) damage in nervous system
 - (D) permanent bluish skin
57. A deep well
- (A) easily gets dried up during summer
 - (B) may yield constant discharge
 - (C) is not deeper than shallow well
 - (D) is formed by just tapping the nearest aquifer to the ground
58. The main factor responsible for sedimentation of a particle is
- (A) specific gravity of the particle
 - (B) specific gravity of the medium
 - (C) difference of sp. gravity of particle and medium
 - (D) sum of sp. gravity of particle and medium

59. Mud balls are formed in a filter because of
- raw water rolling over the filter surface
 - quick filtration of turbid water
 - frequent back washing
 - bond developed between impurities and sand grains due to insufficient back washing
60. Presence of residual chlorine is readily detected by
- methyl orange
 - chrome black T
 - orthotolidine
 - holoquinone
61. Leaping weir is provided only in
- combined system
 - separate system
 - conservancy system
 - partly separate system
62. Sewage farming is best suited for India because
- it is abundantly available
 - it is cheap method of sewage disposal
 - it is a hygienic method
 - nutrients and trace elements required by plants are available in sewage
63. Psychoda alternate is found in
- septic tank
 - standard rate trickling filter
 - high rate trickling filter
 - activated sludge process
64. An equivalent term of 'Mean Cell Retention Time' is
- solid retention time
 - solid age
 - sludge detention time
 - average cell time
65. Sludge digestion is
- disposal of sludge
 - dilution of sludge
 - stabilization of sludge
 - removal of waste products from sludge
66. Any change in moisture content of a soil changes
- value of angle of shearing resistance
 - strength of soil
 - amount of compaction required
 - All of the above

67. The relative density of the soil is given by

- (A) $(e_{\max} - e) / (e_{\max} + e_{\min})$
- (B) $(e_{\max} - e) / (e_{\max} - e_{\min})$
- (C) $(e_{\max} + e) / (e_{\max} + e_{\min})$
- (D) (e_{\max} / e_{\min})

68. Soil in which some of the intermediate size particle are missing is known as

- (A) poorly graded soil
- (B) non-uniform soil
- (C) Ill proportioned soil
- (D) skip graded soil

69. Rolling test is used to differentiate clay from

- (A) gravel
- (B) silt
- (C) sand
- (D) None of the above

70. The permeability of a soil deposit in situ can be obtained by

- (A) falling head permeameter
- (B) constant head permeameter
- (C) pumping test
- (D) None of the above

71. For earthen road the most common camber is

- (A) 1 in 20
- (B) 1 in 24
- (C) 1 in 36
- (D) 1 in 48

72. In plains the minimum length of transition curve is

- (A) V^2 / R
- (B) $V^2 / 1.5R$
- (C) $2.7V^2 / R$
- (D) $V^2 / 24R$

73. A drawback of a rigid pavement is that

- (A) no crack occurs even if local settlement takes place
- (B) it acts as a bridge to cover minor depression like irregularity
- (C) any small rift further widens
- (D) its ability to withstand iron wheeled traffic is less

74. In semi grouted macadam pavement the hoggin material is

- (A) bitumen
- (B) water
- (C) stone powder
- (D) None of the above

75. PUC equivalent for a bus is

- (A) 1.00
- (B) 1.75
- (C) 2.25
- (D) 6.0

76. World's widest gauge is

- (A) 1524 mm
- (B) 1676 mm
- (C) 1829 mm
- (D) 2286 mm

77. Cost of construction of a railway track is proportional to

- (A) $\sqrt{\text{gauge}}$
- (B) gauge
- (C) gauge^2
- (D) None of the above

78. Mica mainly consists of

- (A) calcium carbonate
- (B) magnesium and calcium silicate
- (C) Silica and oxygen
- (D) potassium and aluminium silicate

79. Which of the following has the lowest crushing strength?

- (A) Basalt
- (B) Granite
- (C) Diorite
- (D) Laterite

80. The seven-day compressive strength of a good Portland cement as obtained from the compressive test on cement sand mortar cube should **not** be

- (A) 125 kg/cm^2
- (B) 150 kg/cm^2
- (C) 175 kg/cm^2
- (D) 200 kg/cm^2

81. The defect in painting caused due to sliding of one layer of paint over another is known as

- (A) wrinkling
- (B) blistering
- (C) crazing
- (D) alligating

82. The asbestos content in asbestos cement sheets is roughly

- (A) 5%
- (B) 10%
- (C) 15%
- (D) 30%

83. The defect caused due to overmaturity and unventilated storage during transit is called
- foxiness
 - heart shake
 - cup shake
 - rind gall
84. In a static penetrometer test the angle of the penetrating cone is
- 30°
 - 45°
 - 60°
 - 75°
85. A pile which by itself does not carry any load but improves the bearing capacity of the soil is called
- sheet pile
 - friction pile
 - bearing pile
 - compaction pile
86. The portion of the wall between the facing and backing of the wall is called
- jamb
 - frog
 - throating
 - hearting
87. Oxalic acid is spread and rubbed over the floor which has been ground with machine
- to make the surface look smooth and uniform
 - to fill up any dent that are left on the floor surface
 - to make the surface appear glossy
 - to make the surface durable
88. A group of steps radiating from same point is known as
- dancing steps
 - splayed steps
 - winders
 - fliers
89. If the span of real beam is L , the span of the corresponding conjugate beam is
- $L/2$
 - $L/3$
 - L
 - $2L$
90. An elastic prop is one which
- does not offer any reaction
 - supports the entire load and relieves all other supports completely
 - develops reaction proportional to the compression in itself
 - None of the above

91. The displacement of joints of a truss can be obtained directly from
- space diagram
 - force diagram
 - Williot Mohr diagram
 - funicular polygon
92. The influence line diagram for SF or BM at a section is
- the value of SF or BM at that section when the unit load is placed over that section only
 - the value of SF or BM at that section when the unit load is at the centre of the span
 - the variation in the value of SF or BM at that section as the unit load transverses the span from left to right
 - the SF or BM diagram
93. An arch can be treated as a curve beam
- whose ends are restrained against horizontal movement
 - whose ends do not provide any reaction
 - whose ends are unsupported
 - None of the above
94. The approximate allowable stress in axial compression in reinforced concrete is
- $0.25f_{ck}$
 - $0.33f_{ck}$
 - $0.44f_{ck}$
 - $0.30f_{ck}$
95. The minimum quantity of cement content needed in one m^3 of a reinforced concrete which is expressed to sea weather conditions (in kg) is
- 200
 - 250
 - 300
 - 350
96. Ductility of Fe415 compared to Fe500 is
- more
 - less
 - equal
 - None of the above
97. By over-reinforcing the section in tension, the moment of resistance of beam can be increased by **not** more than
- 10%
 - 20%
 - 25%
 - 18%
98. A compression member is termed as column or strut if the ratio of its effective length to the least lateral dimension is more than
- 3
 - 12
 - 2
 - None of the above

99. The minimum percentage of the total mild steel reinforcement in RCC walls is about
- (A) 0.4
(B) 0.32
(C) 0.2
(D) None of the above
100. The minimum cross pitch should be more than _____ times the diameter of the hole.
- (A) 5 (B) 3
(C) 2.5 (D) 4
101. The approximate minimum edge distance in sheared plates from the centre of hole in a rivetted connection is
- (A) $4t + 100$ mm
(B) $2t + 100$ mm
(C) $4t + 37$ mm
(D) $2.5D$
102. The permissible axial tensile stress in mild steel power driven shop rivet is
- (A) 78.5 (B) 126
(C) 63 (D) 94.5
103. The number of rivets required in a joint is equal to
- (A) load/shear strength of a rivet
(B) load/rivet value
(C) load/bearing strength of a rivet
(D) load/tearing strength of a rivet
104. The strength of a butt weld is
- (A) about 70 to 90 percent of the main member
(B) equal to that of the main member
(C) equal to or more than that of the main member
(D) more than that of the main member
105. Continuous weld of constant thickness is called
- (A) fillet weld
(B) seam weld
(C) stitch weld
(D) butt weld
106. Correction for refraction for a distance of 1 km is
- (A) 0.0112
(B) 0.0673
(C) 0.0785
(D) 0.0673
107. Sensitiveness of bubble tube can be increased by
- (A) using viscous liquid
(B) reducing length of tube
(C) increasing diameter of the tube
(D) reducing internal radius of the tube

108. A contour map of the area is essential before proceeding with the construction of
- (A) building
 - (B) swimming pool
 - (C) dam
 - (D) bridge
109. In a theodolite, errors due to eccentricity of vernier is counteracted by
- (A) reading both the verniers
 - (B) reading different parts of main scale
 - (C) reading right and left face
 - (D) taking both right and left swing readings
110. Anallactic lens is provided to
- (A) nullify both the constants of tachometer
 - (B) render additive constant zero
 - (C) make multiply constant as 100 and additive constant as zero
 - (D) Abney level
111. A dual role event
- (A) is the head event as well as a tail event
 - (B) consumes no time
 - (C) is the beginning of one event and the end of another
 - (D) is any event other than initial and final event
112. According to beta distribution, the standard deviation of the time of completion is given by
- (A) $\sigma = (t_p - t_0) / 3$
 - (B) $\sigma = (t_p - t_0) / 4$
 - (C) $\sigma = (t_p - t_0) / 5$
 - (D) $\sigma = (t_p - t_0) / 6$
113. If the path of activities leads back into itself, the resulting error in the network is known as
- (A) looping
 - (B) dangling
 - (C) interfacing
 - (D) All of the above
114. Slack is given as the difference between
- (A) latest allowable time and earliest expected time
 - (B) latest allowable time and pessimistic time estimate
 - (C) earliest expected time and latest allowable time
 - (D) final event time and latest allowable time
115. If the probability factor is zero, the chances of completing the project in scheduled time is
- (A) 0%
 - (B) 50%
 - (C) 100%
 - (D) 75%

116. When not specified the volume of steel in RCC work, it is taken as
- 1% to 1.6% of RCC volume
 - 2% to 4% of RCC volume
 - 4% to 6% of RCC volume
 - 0.6% to 1.0% of RCC volume
117. The gradual accumulation of money by way of annual periodic deposit which is meant for the replacement of the structure at the end of its useful life period is known as
- annuity
 - depreciation
 - sinking fund
 - None of the above
118. What is the minimum period for which the lime concrete in foundation be left wet without the construction of masonry work?
- 3 days
 - 5 days
 - 7 days
 - 12 days
119. The volume of cement required for 10 m^3 of brickwork in 1:6 cement mortar is approximately equal to
- $3/7 \text{ m}^3$
 - $3/6 \text{ m}^3$
 - $3/4 \text{ m}^3$
 - $3/5 \text{ m}^3$
120. When not specified the number of holdfast for a door, it is usually taken as
- 2
 - 4
 - 6
 - 8
121. Hydrostatic law states that the rate of increase of pressure in a vertical direction is
- equal to the density of the fluid
 - equal to the specific weight of the fluid
 - equal to the weight of the fluid
 - None of the above
122. Draft tube is used for discharging water from the exit of
- Pelton wheel
 - Impulse turbine
 - Kaplan turbine
 - Francis turbine
123. The capillary rise or fall of a liquid is given by
- $h = 4\sigma \cos \theta / \rho g d$
 - $h = 2\sigma \cos \theta / \rho g d$
 - $h = 8\sigma \cos \theta / \rho g d$
 - $h = 6\sigma \cos \theta / \rho g d$

124. The pressure drop per unit length for laminar flow of fluid through a long pipe is proportional to (where, A = cross sectional area of the pipe and D = diameter of the pipe)
- (A) A
 (B) D
 (C) $1/A$
 (D) A^2
125. Drag force is expressed mathematically as
- (A) $F_D = \rho U^2 \times C_D \times A / 2$
 (B) $F_D = \rho U^2 \times C_D \times A$
 (C) $F_D = 2\rho U^2 \times C_D \times A$
 (D) None of the above
126. Hydraulic accumulator is a device used for
- (A) lifting heavy weights
 (B) storing the energy of a fluid in the form of pressure energy
 (C) increasing the pressure intensity of a fluid
 (D) None of the above
127. The square root of the ratio of inertia force to gravity force is
- (A) Reynolds number
 (B) Froude number
 (C) Mach number
 (D) Euler number
128. The relation between linear acceleration (f) and angular acceleration (α) is
- (A) $\alpha = f \times r$
 (B) $\alpha = f / r$
 (C) $\alpha = 1 / (f \times r)$
 (D) $\alpha = r / f$
129. The efficiency of a screw jack for a given value of angle of friction
- (A) depends upon the weight lifted only
 (B) depends upon the effort applied only
 (C) depends upon weight and effort only
 (D) is independent of weight lifted or effort applied
130. If the body is on the point of moving down the plane, the necessary force P would be
- (A) $W \sin (\alpha - \phi)$
 (B) $W \tan (\alpha - \phi)$
 (C) $W \tan (\alpha + \phi)$
 (D) None of the above

131. A flywheel mounted on a shaft, weight 500 kg and has a radius of gyration 50 cm about its axis of rotation. If the flywheel starts from rest and the shaft is subjected for a moment of 625 N-m, the speed of shaft after 4 seconds is equal to

- (A) 30 rad/sec
- (B) 20 rad/sec
- (C) 10 rad/sec
- (D) 40 rad/sec

132. In the case of a partially elastic body that part of the work done by the external forces during deformation is dissipated in the form of heat which is developed in the body during

- (A) non-elastic deformation
- (B) elastic deformation
- (C) 50% of total deformation
- (D) last 25% of total deformation

133. The number of reaction components possible at a hinged end for a general loading is

- (A) 1
- (B) 2
- (C) 0
- (D) 3

134. The difference between any SF values at any two sections will be equal to

- (A) the area of BM diagram between the two sections
- (B) the difference between the slope of the curve of loading diagram at the two sections
- (C) the ordinate of SF diagram at one section plus the slope of the loading diagram multiplied by the distance between the two sections
- (D) the area of the loading diagram between those two sections

135. Which of the following sections is the most efficient in carrying out bending moment?

- (A) Rectangular section
- (B) I-section
- (C) Circular section
- (D) T-section

136. What is the maximum number of unknown reaction components using only static equation of equilibrium?

- (A) 1
- (B) 2
- (C) 3
- (D) 4

- 137.** The instrument used to measure the wind velocity in the atmosphere is
- (A) anemometer
 - (B) pyranometer
 - (C) atmometer
 - (D) None of the above
- 138.** Rainfall hyetograph shows the variation of
- (A) cumulative rainfall with time
 - (B) rainfall intensity with time
 - (C) rainfall depth over area
 - (D) rainfall intensity with the cumulative rainfall
- 139.** For a given storm the average depth of rainfall over an area
- (A) increases with increase in area
 - (B) decreases with increase in area
 - (C) No relation with area
 - (D) None of the above
- 140.** The typical characteristic of convective showers is that they are of
- (A) high intensity and long duration
 - (B) high intensity and short duration
 - (C) low intensity and long duration
 - (D) low intensity and short duration
- 141.** In radar measurement of rainfall, the energy of echo waves depends upon
- (A) the solar radiation
 - (B) the wind velocity
 - (C) the size of raindrop
 - (D) the inclination of rainfall
- 142.** The lag time of the basin is
- (A) the time between the centroid of rainfall diagram and the peak ordinate of the hydrograph
 - (B) the time between the beginning and ending of direct run-off
 - (C) the time between the beginning and ending of effective rainfall
 - (D) the time taken for the remotest particle to reach the basin outlet
- 143.** Rainfall simulation is used for the determination of
- (A) rainfall
 - (B) interception
 - (C) evaporation
 - (D) infiltration

144. Soil moisture deficiency is the difference between
- (A) saturation capacity and the existing soil moisture content
 - (B) field capacity and the existing soil moisture content
 - (C) permanent wilting point and the existing moisture content
 - (D) temporary wilting point and the existing moisture content
145. Canals which are excavated directly from the river with or without head regulator are called
- (A) natural canal
 - (B) ditch canal
 - (C) seasonal canal
 - (D) inundation canal
146. The capacity factor is defined as the ratio of
- (A) the mean discharge in the canal to the peak discharge
 - (B) the peak discharge to the average discharge
 - (C) the peak discharge to the ayacut irrigated by the canal
 - (D) the ayacut irrigated to the peak discharge
147. A low gravity dam is one in which
- (A) the height of water stored is less than 30 m
 - (B) the resultant just passes through the downstream middle third point
 - (C) the maximum principal stress is less than the allowable crushing strength and the upstream face is entirely vertical
 - (D) the height of the dam is less than 5 times the top width
148. The trap efficiency of a reservoir is a function of
- (A) reservoir capacity/total inflow
 - (B) age of the reservoir
 - (C) reservoir capacity
 - (D) total inflow
149. Koyna dam is located in
- (A) Karnataka
 - (B) Maharashtra
 - (C) Tamil Nadu
 - (D) Odisha
150. Another name for shaft spillway is
- (A) morning glory spillway
 - (B) chute spillway
 - (C) trough spillway
 - (D) tunnel spillway