JAMMU AND KASHMIR PUBLIC SERVICE COMMISSION

RESHAM GHAR COLONY, BAKSHI NAGAR, JAMMU - 180001

Website: http://jkpsc.nic.in

email: coejkpsc2017@gmail.com

Jammu: 0191-2566533

Subject: **Conduct of Written Examination for the post of Geologist Grade-III and Driller in Department of Mining- Provisional Answer Key(s) thereof.**

Notification No. PSC/Exam/S/2024/51
Dated: 29.08.2024

In pursuance of Rule 10(c) of the Jammu & Kashmir Public Service Commission (Conduct of Examination) Rules, 2022, as amended upto date, the Provisional Answer Key(s) of Question Paper pertaining to the **Written Test for the post of Geologist Grade-III and Driller** held on **29.08.2024**, are hereby notified for seeking objections from candidates:

PROVISIONAL ANSWER KEY
(GEOLOGIST GRADE-III)

Test Booklet Question No. (Series A)	
Q1	C
Q2	A
Q3	A
Q4	B
Q5	B
Q6	A
Q7	A
Q8	B
Q9	C
Q10	A
Q11	A
Q12	C
Q13	A

Test Booklet Question No. (Series A)	
Q14	A
Q15	A
Q16	C
Q17	D
Q18	C
Q19	A
Q20	B
Q21	B
Q22	D
Q23	B
Q24	D
Q25	C
Q26	B

Test Booklet Question No. (Series A)	
Q27	A
Q28	C
Q29	B
Q30	A
Q31	B
Q32	A
Q33	B
Q34	C
Q35	A
Q36	C
Q37	A
Q38	C
Q39	A

Test Booklet Question No. (Series A)	
Q40	B
Q41	D
Q42	C
Q43	A
Q44	C
Q45	A
Q46	B
Q47	B
Q48	B
Q49	B
Q50	A
Q51	B
Q52	C
Q53	A
Q54	B
Q55	C
Q56	C
Q57	B
Q58	C
Q59	A
Q60	B

Test Booklet Question No. (Series A)	
Q61	C
Q62	D
Q63	B
Q64	A
Q65	C
Q66	B
Q67	C
Q68	D
Q69	B
Q70	A
Q71	C
Q72	A
Q73	D
Q74	C
Q75	A
Q76	C
Q77	D
Q78	A
Q79	A
Q80	D
Q81	B

Test Booklet Question No. (Series A)	
Q82	C
Q83	A
Q84	C
Q85	D
Q86	D
Q87	C
Q88	C
Q89	D
Q90	A
Q91	C
Q92	C
Q93	A
Q94	A
Q95	D
Q96	A
Q97	A
Q98	A
Q99	B
Q100	D

PROVISIONAL ANSWER KEY
(DRILLER)

Test Booklet Question No. (Series A)	
Q1	C
Q2	B
Q3	B
Q4	C
Q5	A
Q6	D
Q7	D
Q8	D
Q9	B
Q10	B
Q11	C
Q12	A
Q13	D
Q14	B
Q15	A
Q16	D
Q17	C
Q18	B
Q19	B
Q20	B
Q21	C
Q22	B
Q23	A
Q24	B
Q25	B
Q26	D
Q27	B
Q28	D
Q29	B
Q30	C
Q31	D
Q32	C
Q33	D
Q34	B

Test Booklet Question No. (Series A)	
Q35	D
Q36	D
Q37	A
Q38	C
Q39	D
Q40	B
Q41	C
Q42	D
Q43	B
Q44	D
Q45	D
Q46	D
Q47	C
Q48	B
Q49	C
Q50	C
Q51	A
Q52	C
Q53	B
Q54	C
Q55	A
Q56	A
Q57	B
Q58	A
Q59	C
Q60	D
Q61	A
Q62	C
Q63	B
Q64	D
Q65	B
Q66	A
Q67	C
Q68	A

Test Booklet Question No. (Series A)	
Q69	C
Q70	A
Q71	C
Q72	B
Q73	A
Q74	A
Q75	A
Q76	D
Q77	B
Q78	C
Q79	B
Q80	D
Q81	D
Q82	A
Q83	B
Q84	C
Q85	C
Q86	B
Q87	C
Q88	B
Q89	B
Q90	A
Q91	C
Q92	A
Q93	B
Q94	D
Q95	D
Q96	A
Q97	A
Q98	C
Q99	A
Q100	B

The candidates are advised to refer to **Question Booklet (Series A)** to match the corresponding question(s) in their respective Question Booklet Series and if any candidate feels that the key to any of the question(s) is/are wrong, he/she may represent on prescribed format/proforma annexed as **Annexure-A** along with the documentary proof/evidence **(hard copies only)** and fee of Rs.500/- per question in the form of Demand Draft drawn in favour of **COE, J&K PSC** (refundable in case of genuine/correct representation) to the Controller of Examinations, Jammu & Kashmir Public Service Commission, from 30.08.2024 to 03.09.2024. **The candidates are further advised to clearly mention the question(s) objected to with reference to its serial number as it appears in the Question Booklet of Series A of the Provisional Answer Key.**

Further, any objection/application not accompanied by the requisite Demand Draft of Rs.500/- as prescribed, shall not be considered/entertained under any circumstances. Candidates are, in their own interest, advised to adhere to these instructions and not submit any objection unaccompanied by the Demand Draft as required under extant rules.

The Commission shall not entertain any such representation(s) after the expiry of the stipulated period i.e. **after 03.09.2024 (Tuesday), 05.00 pm.**

The provisional answer key(s) are available on the website of the Commission http://www.jkpsc.nic.in.

29/08/24

(Sachin Jamwal) JKAS
Controller of Examinations
J&K Public Service Commission

No. PSC/Ex-Secy/2024/36 Dated: 29.08.2024

Copy to the: -

1. Director, Information and Public Relations, J&K for publication of the notice in all leading newspapers published from Jammu/Srinagar.
2. P.S. to Hon'ble Chairman, J&K Public Service Commission for information of the Hon'ble Chairman.
3. P.S. to Hon'ble Member, Shri _____ for information of the Hon'ble Member.
4. P. A. to Secretary, J&K Public Service Commission for information of the Secretary.
5. Main file/Stock file/Notice Board.

Annexure-A

Representation regarding objection(s) to any Question/Answer pertaining to the Written Test conducted for the post of Geologist Grade-III and Driller on 29.08.2024

(NOTE: USE SEPARATE FORMS FOR SEPARATE QUESTIONS)

Name of the Post : _____

Name of the Applicant : _____

Roll No. : _____

Correspondence Address : _____

Contact/Mobile No. : _____

Date of Application: _____.2024

Demand Draft No. date : _____

Candidates Account No.(16 digit) & IFSC Code : _____

_____

Question No. in Series A	Details of the Objection	Resource Material (copy to be enclosed)	Details of the Website (if any)
Correct Answer/Option as per candidate :			

Signature of the Candidate

Note: **Application for each question/answer shall be made on separate page in the given format, otherwise the first question entered in the format shall only be considered.**

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO

Booklet Serial No. 220213

Test Booklet Series

TEST BOOKLET
GEOLOGIST GRADE III
Written Test - 2024
(22)

A

Time Allowed: Two Hours ***Maximum Marks: 100***

INSTRUCTIONS

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET ***DOES NOT*** HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS, ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.

2. **Please note that it is the candidate's responsibility to encode and fill in the Roll Number and Test Booklet Series Code A, B, C or D carefully and without any omission or discrepancy at the appropriate places in the OMR Answer /Response Sheet. Any omission/discrepancy will render the Response Sheet liable for rejection.**

3. You have to enter your Roll Number on the Test Booklet in the Box provided alongside. ***DO NOT*** **write** ***anything else*** on the Test Booklet.

4. This Test booklet contains **100** items (questions). Each item comprises of four responses (answers). You will select the response which you want to mark on the Answer Sheet/Response Sheet. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose ***ONLY ONE*** response for each item.

5. You have to mark all your responses ***ONLY*** on the separate Answer /Response Sheet provided. *See directions in the Response Sheet.*

6. ***All*** items carry equal marks.

7. Before you proceed to mark in the Answer /Response Sheet, the response to various items in the Test Booklet, you have to fill in some particulars in the Answer /Response Sheet as per instructions sent to you with your Admission Certificate.

8. After you have completed filling in all your responses on the Response Sheet and the examination has concluded, you should hand over to the Invigilator ***only the Answer /Response Sheet***. You are permitted to take away with you the Test Booklet and ***Candidate's Copy of the Response Sheet .***

9. Sheets for rough work are appended in the Test Booklet at the end.

10. While writing Centre, Subject and Roll No. on the top of the Answer Sheet/Response Sheet in appropriate boxes use **"ONLY BALL POINT PEN".**

11. **Penalty for wrong answers:**

THERE WILL BE PENALTY FOR WRONG ANSWERS MARKED BY THE CANDIDATE IN THE WRITTEN TEST (OBJECTIVE TYPE QUESTIONS PAPERS).

(i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, **(0.25)** of the marks assigned to that question will be deducted as penalty.

(ii) If a candidate gives more than one answer, it will be treated as a **wrong answer** even if one of the given answers happens to be correct and there will be same penalty as above for that question.

(iii) If a question is left blank, i.e., no answer is given by the candidate, there will be **no penalty** for that question.

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO

(22) (A) (2)

1. Which of the following is made up of bright, glassy looking, jet like coal band with conchoidal fracture?

A) Fusain

B) Clarain

C) Vitrain

D) Attritus

2. Consider the following statement:

Assertion (A) : Serpentinization is the process involves conversion of olivine to serpentine with addition of water.

Reason (R) : This alteration may be possible due to hot residual solutions that emanated from within the intrusives.

Choose the correct option:

A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).

B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).

C) Assertion (A) is true and Reason (R) is false.

D) Assertion (A) is false and Reason (R) is true.

3. The standard international weight of gems are measured in

A) Metric carat

B) Pound

C) Milli gram

D) None of the above

4. Match the following

Mineral		**Hardness**	
i)	Barytes	1)	8
ii)	Calcite	2)	3-3.5
iii)	Gypsum	3)	2
iv)	Topaz	4)	3.0

Choose the correct option

A) i-1, ii-2, iii-3, iv-4

B) i-2, ii-4, iii-3, iv-1

C) i-4, ii-3, ,iii-2, iv-1

D) i-3, ii-4, iii-2, iv-1

5. Consider the following statement:

Assertion (A) : Fire clay are high-alumina clays with some non-plastic refractory flint and moderately refractory clays , which withstand temperature rise of 2714°F to 2984°F

Reason (R) : Fire clays are considered to have originated from suspended matter carried by low-gradient streams into coal swamps.

Choose the correct option:

A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).

B) Both Assertion (A) and Reason(R) are the true but Reason (R) is not a correct explanation of Assertion (A).

C) Assertion (A) is true and Reason (R) is false.

D) Assertion (A) is false and Reason (R) is true.

6. Consider the following statement:

Statement A : The ultimate failure strength depends on its composition, fabric, structural feature.

Statement B: It does not depend on its orientation to the direction of loading.

Choose the correct option:

A) A is correct B is wrong

B) B is correct A is wrong

C) Both A and B are correct

D) Both A and B are wrong

7. Which of the following rock have comparatively higher level of stability?

A) Muscovite

B) Pyroxene

C) Na-Plagioclase

D) Olivine

8. Which type of dam is preferred for narrow river gorges and is convex to the upstream side?

A) Gravity Dam

B) Arch Dam

C) Buttress Dam

D) Earth Dam

9. The ratio of openings (void) in the soil or a rock to the volume of the soil or rock is

A) Permeability

B) Transmissivity

C) Porosity

D) Storage capacity.

10. Consider the following statement:

Assertion (A) : Mechanical weathering is faster in arid regions with high temperature

Reason (R) : As the temperature increases the vibration of atoms and ions in the rock mineral structure are more, ultimately leading to the development of crack at the macro-level.

Choose the correct option:

A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).

B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).

C) Assertion (A) is true and Reason (R) is false.

D) Assertion (A) is false and Reason (R) is true.

11. The rock masses present or lacking in between the elevations of the successive observation points also cause variations in gravity values. Such values are reduced by applying.

A) Bouguer correction

B) Free air correction

C) Latitude correction

D) Terrain correction

12. The equatorial radius of the Earth is _____Kms

A) 6325

B) 6356

C) 6378

D) 6390

13. The Velocity of the seismic wave in rock salt is

A) 4500 m/sec

B) 3000 m/sec

C) 1500 m/sec

D) <1000 m/sec

14. The total intensity of the Earth's field at the magnetic poles is about

A) 70,000 gammas

B) 54,000 gammas

C) 45,000 gammas

D) 39,000 gammas

15. The condition for Q-type resistivity curve for three layers indicates.

A) High-low-low

B) Low-low-high

C) High-low-high

D) Low-high-low

16. In an electromagnetic method, the greater the conductivity and higher the frequency, the stronger will be the

A) Alternative current

B) Magnetic strength

C) Induced Current

D) Intensity.

17. The method used to produce seismic waves by shooting explosives in the air a feet above the surface of the ground is

A) Fan shooting method

B) Arc shooting method

C) Profile shooting method

D) Poulter method

18. The type of seismic waves, where the motion of the particles is horizontal and transverse to the direction of propagation is known as.

A) Longitudinal waves

B) Shear waves

C) Love waves

D) Rayleigh waves

19. Among the following diamagnetic minerals, which has least magnetic susceptibility.

A) Diamond

B) Calcite

C) Quartz

D) Anhydrite

20. When a magnetic rock is heated to the curie point and then cooled, its magnetism reappears at a much lower temperature, known as.

A) Critical Temperature

B) Temperature Hysteresis

C) Saturation

D) Inverse polarisation

21. The porosity percentage for the basalt rock is

A) 13%

B) 17%

C) 25%

D) 28%

22. In a geophysical logging for the groundwater investigation, the presence of clay or shale content can be obtained by using_____technique.

A) Sonic logs

B) Caliper logs

C) Neutron logs

D) Natural gamma logs

23. In general, the specific yield for thick unconsolidated formations tend to fall in the range of .

A) 2-5 %

B) 7-15 %

C) 10-20 %

D) 15-25 %

24. The chemistry of natural groundwater flow systems can be used to determine

i. Groundwater flow paths

ii. Ground water mixing

iii. Groundwater discharge

iv. Groundwater flow rates

Choose the correct option:

A) i, iii and iv only

B) ii and iv only

C) ii only

D) i, ii and iv only

25. A common geochemical sequence in groundwater includes_____waters near ground surface varying to _____waters in the deepest portions of formations.

A) Bicarbonate and Carbonate

B) Carbonate and Nitrate

C) Bicarbonate and Chloride

D) Chloride and Nitrate

26. Among the following, which water is usually highly mineralized?

A) Juvenile water

B) Connate waters

C) Meteoric waters

D) Magmatic waters

27. A dissolved gas present in the groundwater which is derived from the underground biochemical process.

A) Hydrogen sulfide

B) Nitrogen

C) Carbon dioxide

D) Oxygen

28. Specific yield of unconfined aquifers can be obtained by using

A) Natural gamma logs

B) Caliper logs

C) Neutron logs

D) Sonic logs

29. Resistivity values for clay is

A) $0.32\,\Omega - m$

B) $1\,\Omega - m$

C) $2.5\,\Omega - m$

D) $3.5\,\Omega - m$

30. TDS in ppm is equal to

A) $0.64 \times$ EC in μ mhos/cm

B) $0.48 \times$ EC in μ mhos/cm

C) $0.32 \times$ EC in μ mhos/cm

D) $0.16 \times$ EC in μ mhos/cm

31. What type of fault results from horizontal compressional stress and typically exhibits a low-angle reverse fault plane?

A) Normal fault

B) Thrust fault

C) Strike-slip fault

D) Oblique-slip fault

32. What term describes the tendency of certain minerals or rocks to break along parallel planes?

A) Cleavage

B) Jointing

C) Fracture

D) Faulting

33. Which type of fold has limbs that dip away from the axis in opposite directions?

A) Anticline

B) Syncline

C) Monocline

D) Overturned fold

34. Which type of strain results in the permanent deformation of rocks without significant fracturing?

A) Elastic strain

B) Brittle strain

C) Plastic strain

D) Fracture strain

35. Which of the following is the external shape of a crystal reflects its internal atomic arrangement.

A) Symmetry

B) Reflection

C) Unit Lattice

D) Molecule

36. _____occur in a cubic crystal with six identical faces because its atoms are arranged in a cubic pattern with identical structure in three perpendicular directions.

A) Leucite

B) Nepheline

C) Halite

D) Chabazite.

37. Consider the following statements:

Statement A: The angle between the incoming beam and a perpendicular to the interface is the angle of incidence.

Statement B: The angle between the outgoing beam and parallel to the interface is the angle of refraction.

Choose the correct option:

A) A is correct B is wrong

B) B is correct A is wrong

C) Both A and B are correct

D) Both A and B are wrong

38. Match the following:

	List - I		**List - II**
i)	Wollastonite	1)	$CaMgSi_2O_6$
ii)	Ferrosilite	2)	$MgSiO_3$
iii)	Enstatite	3)	$FeSiO_3$
iv)	Diopside	4)	$CaSiO_3$

Choose the correct option:

A) i-1, ii-2, iii-3, iv-4

B) i-2, ii-4, iii-3, iv-1

C) i-4, ii-3, iii-2, iv-1

D) i-3, ii-4, iii-2, iv-1

39. Consider the following statement:

Assertion (A) : If a crystal has certain symmetry, the unit cell must have at least as much symmetry.

Reason (R) : Crystal consist of unit cells, the symmetry of the crystal can never be more than that of its unit cell.

Choose the correct option:

A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).

B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).

C) Assertion (A) is true and Reason (R) is false.

D) Assertion (A) is false and Reason (R) is true.

40. Angles such as 30°, 45°, 60°, 90°, or 120° are called_____

A) Non Special angle

B) Special angle

C) General angle

D) Normal angle

41. Match the following

	Axis	**Rotation angle**
i)	$\bar{1}$	1) 90°
ii)	$\bar{2}$	2) 180°
iii)	$\bar{3}$	3) 360°
iv)	$\bar{4}$	4) 120°

Choose the correct option:

A) i-1, ii-2, iii-3, iv-4

B) i-2, ii-4, iii-3, iv-1

C) i-4, ii-3, iii-2, iv-1

D) i-3, ii-2, iii-4, iv-1

42. Which of the following shows conchoidal fracture?

A) Wollastonite

B) Copper

C) Quartz

D) Gold

43. In closed form, does Dodecahedron has how many faces

A) 12

B) 24

C) 6

D) 8

44. Which of the following is not belonging to Pyroxene group.

A) Enstatite

B) Augite

C) Hornblende

D) Jadieite

45. Cranidium is a region between_____
   A) Fixed cheek and glabella
   B) Free cheek and glabella
   C) Free cheeks and fixed cheeks
   D) Cephalon and thorax

46. Estimation of the relative rates of sedimentation have been calculated by comparing the population of _____
   A) Living and fossil foraminifera
   B) Living and Total foraminifera
   C) Fossil and dead foraminifera
   D) Lab culture foraminifera

47. A mineral can be replaced by another mineral without any change in the external form is known as
   A) Isomorphs
   B) Pseudomorphs
   C) Polymorphs
   D) Dimorphs

48. The Plant fossil *Glossopter* is indicates_____
   A) Warm climate
   B) Glacial to cool temperature
   C) Arid climate
   D) Moist to hot climate

49. In Echinoid shell, on the oral side, when the mouth is surrounded by a ring of calcareous plates is known as :
   A) Ocular plates
   B) Peristome
   C) Genital plate
   D) Periproct

50. Shells with first Ammonitic suture appeared in _____
   A) Late Triassic
   B) Late Permian
   C) Late Devonian
   D) Late Jurassic.

51. Well preserved entire organism, unaltered and altered hard parts and naturally formed moulds and casts are classed as _____

A) Living fossil,

B) Body fossil,

C) Chemical fossil,

D) Trace fossil.

52. Which one of the following is a planktonic Foraminifera

A) Ammonia

B) Operculina

C) Globigerina

D) Nummulites

53. Human beings evolved during which geologic period?

A) Eocene

B) Cretaceous

C) Permian

D) Cambrian

54. The study of the plant life of the geological past is_____

A) Psilopsida,

B) Palaeobotany,

C) Megafossil,

D) Thallophyta.

55. Which form of the graptolites is well known during upper Cambrian age?

A) Tetragraptus

B) Clonograptus

C) Bryograptus

D) All of the above

56. In the centre of the calyx, there is the axis of the corallite which is known as the _____?

A) Fossula

B) Epitheca,

C) Collumella

D) Corallum

57. During which geologic period did Archaeopteryx live?

A) Cretaceous

B) Jurassic

C) Permian

D) Tertiary.

58. The _____was an era dominated by the dinosaurs.

A) Precambrian

B) Paleozoic

C) Mesozoic

D) Cenozoic

59. The most primitive suture line in the Trilobites is described as

A) Hypoparian

B) Opisthoparian

C) Proparian

D) Gonatoparian

60. The thickness of the Earth's lower mantle is about_____Kms.

A) 1000

B) 1900

C) 2100

D) 2700

61. Choose the correct pair

	Fumaroles's type	-	***Temperature***
A)	Solfataras	-	Below 100°C
B)	Dry fumaroles	-	100 to 200°C
C)	Acid fumaroles	-	300 to 400°C
D)	Alkaline fumaroles	-	400 to 500°C

62. Match the following:

List - I	List - II
1) Planetesimal Hypothesis	i) Otto Schmidt
2) Double star Hypothesis	ii) Jeans and Jeffreys
3) Meteorite Hypothesis	iii) Chamberlin and Moulton
4) Tidal Hypothesis	iv) Lyttleton

Choose the correct option:

A) 1-iii, 2-i, 3-iv, 4-ii
B) 1-ii, 2-i, 3-iv, 4-iii
C) 1-i, 2-iii, 3-ii, 4-iv
D) 1-iii, 2-iv, 3-i, 4-ii

63. The temperature of lavas during eruptions usually ranges between_____and_____

A) 800° C; 1100°C
B) 900° C; 1200°C
C) 900° C; 1500°C
D) 1100° C; 1500°C

64. The hillocks made up of harder, durable and resistant rocks on the surface of the peneplains are termed as .

A) Monadnocks
B) Inselbergs
C) Mesa
D) Hogbacks

65. The tabular masses of more resistant rock resting on under-cut pillars of softer material and are very often elongated in the direction of prevailing wind; besides the strata are horizontal.

A) Ventifacts
B) Yardangs
C) Zeugen
D) Pedestal rock

66. Which one of the following landforms has the shape of an asymmetric low ridge or hill beds with a steep scrap on one side and a gentle slope on the other is known as .

A) Escarpment
B) Cuestas
C) Mesa
D) Butte

67. The hypothesis of sea-floor spreading was first formulated by

A) Tuzo Wilson
B) Fred Vine
C) Harry Hess
D) Drummond Mathews

68. A knob-like obstruction in the path of the ice gets plastered above and around with dense clay and boulders, which are then moulded in to a low streamlined hill called

A) Crescentric gouges

B) Roches mountonnees

C) Askers

D) Drumlins

69. The deposits formed at the slip off slope of a meandering river is known as

A) Bajada

B) Point-bar

C) Alluvial fans

D) Cones

70. Consider the following statement:

Assertion (A) : Many geographical objects have inherently fuzzy spatial extents.

Reason (R) : One common solution to this problem is to allow objects to have multiple representations which depends on the scale.

Choose the correct option:

A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).

B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).

C) Assertion (A) is true and Reason (R) is false.

D) Assertion (A) is false and reason (R) is true.

71. Road is the _____

A) Point map feature

B) Polygon map feature

C) Line map feature

D) None of the above

72. In which of the following method allows ready manipulation of the data in a many to -one relationship of the attribute values and the sets of gris cells.

A) MAP Model

B) IMGRID Model

C) GRID Model

D) TIGER Model

73. Match the following

	Errors		Description
i)	Missing Segment	1)	Delete node if needed
ii)	A gap between two segments	2)	Merge nodes or extend segment
iii)	An overshoot	3)	Indicate which arc to extend or which node to move
iv)	An undershoot	4)	Draw it

Choose the correct option:

A) i-1, ii-2, iii-3, iv-4

B) i-2, ii-4, iii-3, iv-1

C) i-4, ii-3, iii-2, iv-1

D) i-3, ii-4, iii-2, iv-1

74. Consider the following statements:

Statement A : Difference in moisture content of the soil or rock result in difference in tone.

Statement B : Tonal contrast can be enhanced by use of high contrast film, high contrast paper or by specialized image processing technique such as dodging

Choose the correct option:

A) A is correct B is wrong

B) B is correct A is wrong

C) Both A and B are correct.

D) Both A and B are wrong

75. _____ is an expression of roughness or smoothness as exhibited by the imagery and it is the rate of change of tonal values.

A) Tone

B) Texture

C) Shadows

D) Pattern

76. A_____ filter may be implemented by subtracting a low pass filtered image (pixel by pixel) from the original, unprocessed image.

A) Low pass filter

B) Median Filter

C) High Pass filter

D) None of the above

77. _____ is the orderly spatial arrangement of geological topographic or vegetation features.

A) Tone

B) Texture

C) Shadows

D) Pattern

78. The point where the satellite, travelling northwards, passes directly over the equator is called the _____.

A) Ascending node

B) Descending node

C) Equatorial node

D) Lateral node

79. Repeat cycle of GOES Satellite

A) One per hour

B) Two per hour

C) Four per hour

D) Five per hour

80. Which of the following is the correct order of elements of Earth's crust in decreasing order of their percentage?

A) Aluminium, Iron, Silicon, Oxygen

B) Oxygen, Aluminium, Iron, Silicon

C) Iron, Aluminium, Silicon, Oxygen

D) Oxygen, Silicon, Aluminium, Iron

81. The matrix of Packstone is _____

A) Clay

B) Mud

C) Silt

D) Sand

82. The crust and upper part of the mantle form a single unit called

A) Asthenosphere

B) Biosphere

C) Lithosphere

D) Hydrosphere

83. Meteorite containing hardened basaltic droplet chondrules known as

A) Chondrite

B) Achondrite

C) Stony meteorite

D) Iron meteorite

84. Rocks of mechanical origin having grain size finer than 1/16 mm is called as

A) Rudite

B) Arenite

C) Lutite

D) Tillite

85. Which of the following mineral is not used for Uranium-Lead method of dating?

A) Zircon

B) Monazite

C) Sphene

D) Feldspar

86. The average slope of continental shelf is

A) 4°

B) 0.05°

C) 0.5°

D) 1°

87. _____ are asymmetrical elongate V-shaped depressions produced by objects hitting a sediment surface momentarily.

A) Groove marks
B) Chevron
C) Prod marks
D) Flute cast

88. In sedimentary rocks the pattern formed by framework grains, matrix and cement is called _____ texture

A) Allochemical
B) Orthochemical
C) Clastic
D) Non-clastic

89. Fossiliferous limestone interbedded with marl is characteristic feature of _____ facies

A) Basin margin
B) Carbonate platform
C) Open marine platform
D) Shelf

90. A orthogeosyncline with actively subsiding areas and volcanics present with sediments is

A) Eugeosynclines
B) Miogeosyncline
C) Exogeosyncline
D) Autogeosyncline

91. Consider the following statement:

Assertion (A): The Regur soil of the Deccan Plateau are black in colour

Reason (R) : They contain a lot of humus.

Choose the correct option

A) Both A and R are true and R is the correct explanation of A.
B) Both A and R is true but R is not the correct explanation of A.
C) A is true but R is false.
D) A is false but R is true.

92. Which of the following is a surface of erosion, which may be covered by a thick residual soil that grades into the underlying bed rock.

A) Non-conformity
B) Local-conformity
C) Blended unconformity
D) Disconformity

93. With continued erosion of a nappe, and window sometimes a remnant of the thrust sheet is left as a relict block, which is called_____.

A) Klippe

B) Window

C) Contour

D) Nappes

94. Which of the following fault is parallel to the dip of the country rock

A) Dip Fault

B) Diagonal Fault

C) Strike Fault

D) Transverse Fault

95. Which one is elongated large basins which are found submerged beneath the sea-water and contain very great thickness of sediments.

A) Box Fold

B) Kink bands

C) Geoanticline

D) Geosyncline

96. A group of small sized faults that overlaps each other in the region of their occurrence.

A) Radial fault

B) En echelon Fault

C) Peripheral Fault

D) Parallel Fault

97. Degree of High-angle fault.

A) More than 45°

B) Less than 45°

C) Less than 90°

D) Mor than 90°

98. The stretch of the rock beds lying between any crest and any of the adjacent troughs on either side is known as the limb of the fold.

A) Limb
B) Axial plane
C) Axis
D) Hinge

99. _____ is the angle between a horizontal surface and the plane of the fault and is measured in a vertical plane that strikes at right angles to the fault

A) Strike
B) Dip
C) Hade
D) Heave

100. Joints, which have developed due to the tensile forces acting on the rocks

A) Shear joints
B) Compression joints
C) Tension joints
D) Mural joints

ROUGH WORK

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO

Booklet Serial No. 220621

Test Booklet Series

A

TEST BOOKLET
DRILLER
Written Test - 2024
(23)

Time Allowed: Two Hours *Maximum Marks: 100*

INSTRUCTIONS

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET ***DOES NOT*** HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS, ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
2. **Please note that it is the candidate's responsibility to encode and fill in the Roll Number and Test Booklet Series Code A, B, C or D carefully and without any omission or discrepancy at the appropriate places in the OMR Answer /Response Sheet. Any omission/discrepancy will render the Response Sheet liable for rejection.**
3. You have to enter your Roll Number on the Test Booklet in the Box provided alongside. ***DO NOT*** **write** ***anything else*** on the Test Booklet.
4. This Test booklet contains **100** items (questions). Each item comprises of four responses (answers). You will select the response which you want to mark on the Answer Sheet/Response Sheet. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose ***ONLY ONE*** response for each item.
5. You have to mark all your responses ***ONLY*** on the separate Answer /Response Sheet provided. *See directions in the Response Sheet.*
6. *All* items carry equal marks.
7. Before you proceed to mark in the Answer /Response Sheet, the response to various items in the Test Booklet, you have to fill in some particulars in the Answer /Response Sheet as per instructions sent to you with your Admission Certificate.
8. After you have completed filling in all your responses on the Response Sheet and the examination has concluded, you should hand over to the Invigilator ***only the Answer /Response Sheet.*** You are permitted to take away with you the Test Booklet and ***Candidate's Copy of the Response Sheet .***
9. Sheets for rough work are appended in the Test Booklet at the end.
10. While writing Centre, Subject and Roll No. on the top of the Answer Sheet/Response Sheet in appropriate boxes use **"ONLY BALL POINT PEN".**
11. **Penalty for wrong answers:**

    THERE WILL BE PENALTY FOR WRONG ANSWERS MARKED BY THE CANDIDATE IN THE WRITTEN TEST (OBJECTIVE TYPE QUESTIONS PAPERS).

    (i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, **(0.25)** of the marks assigned to that question will be deducted as penalty.

    (ii) If a candidate gives more than one answer, it will be treated as a **wrong answer** even if one of the given answers happens to be correct and there will be same penalty as above for that question.

    (iii) If a question is left blank, i.e., no answer is given by the candidate, there will be **no penalty** for that question.

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO

(23)(A) (2)

1. "The moment of resultant of all the forces in a plane about any point is equal to the algebraic sum of moment of all the forces about the same point" is called the _____.

   A) Lami's theorem.

   B) Parallelogram law.

   C) Varignon's theorem.

   D) Triangle law.

2. The resultant of two forces P and Q is R. If Q is doubled, the new resultant is perpendicular to P. Then.

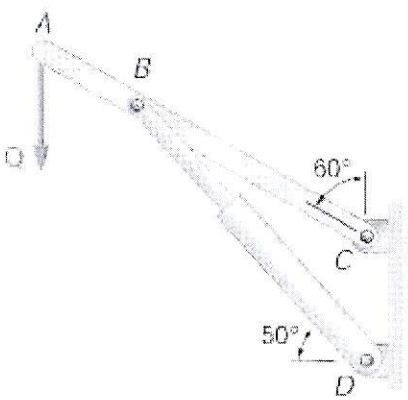
   A) $P = Q$

   B) $Q = R$

   C) $Q = 2R$

   D) None of the above

3. The hydraulic cylinder BD exerts on member ABC a force P directed along line BD. Knowing that P must have a 750-N component perpendicular to member ABC, the magnitude of the force P will be _____



   A) 2320 N

   B) 2190 N

   C) 1984 N

   D) 1759 N

4. A smooth cylinder lying on a _____ is in neutral equilibrium.

A) Curved surface.

B) Convex surface.

C) Horizontal surface.

D) Inclined surface.

5. The angle between two equal forces 'P', when their resultant is equal to 'P' is _____.

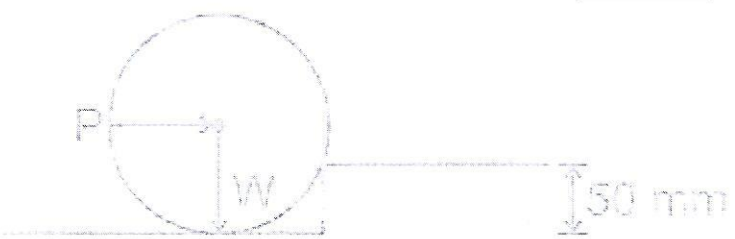
A) 120°

B) 90°

C) 151°

D) 45°

6. A cylinder of radius 250 mm and weight, W = 10kN is rolled up an obstacle of height 50 mm by applying a horizontal force P at its centre as shown in the figure. All interfaces are assumed frictionless. The minimum value of P is _____.



A) 4.5 kN

B) 5.0 kN

C) 6.0 kN

D) 7.5 kN

7. A weight of 200 N is to be lifted by an effort of 60 N, by second system of pulleys having three pulleys in the upper block and two pulleys in the lower block. The velocity ratio of the system will be _____.

A) 2

B) 3

C) 1

D) 5

8. A car moving with speed u can be stopped at a minimum distance 'x' when brakes are applied. If the speed becomes 'n' times, the minimum distance over which the car can be stopped would take the value _____.

A) x/n

B) nx

C) x/n^2

D) n^2x

9. A body is rotating with an angular velocity of 5 rad/s. After 4s, the angular velocity of the body becomes 13 rad/s. The angular acceleration of the body will be _____.

A) 3 rad/s^2

B) 2 rad/s^2

C) 1 rad/s^2

D) 1.5 rad/s^2

10. Ball A is thrown straight up with an initial speed of V_0 and reaches a maximum elevation of h before falling back down. When A reaches its maximum elevation, a second ball is thrown straight upward with the same initial speed V_0. At what height, y, will the balls cross paths?

A) $y = h/2$

B) $y > h/2$

C) $y < h/2$

D) $y = 0$

11. The _____ velocity of a body is the velocity with which the distance travelled by the body in the same interval of time is the same as with variable velocity.

A) Initial.

B) Final

C) Average

D) Instantaneous.

12. The acceleration of a particle moving with simple harmonic motion is maximum when the particle is at _____

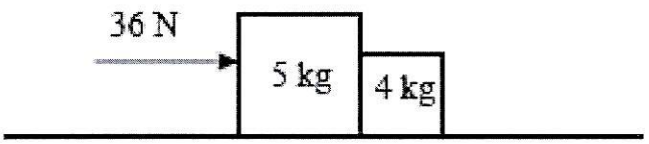
A) Its extreme position.

B) Its mean position.

C) A point between its mean position and extreme position.

D) None of the above

13. Two rigid bodies of mass 5 kg and 4 kg are at rest on a frictionless surface until acted upon by a force of 36 N as shown in the figure. The contact force generated between the two bodies is _____.



A) 4.0 N

B) 7.2 N

C) 9.0 N

D) 16.0 N

14. The ratio of tension on the tight side to that on the slack side in a flat belt drive is _____.

A) Proportional to the product of the coefficient of friction and lap angle.

B) An exponential function of the product of the coefficient of friction and lap angle.

C) Proportional to lap angle.

D) Proportional to the coefficient of friction.

15. A machine having an efficiency greater than 50% is known as

A) Reversible machine.

B) Non - reversible machine.

C) Neither reversible nor non - reversible machine.

D) Ideal machine.

16. A thin rod of length L and mass M will have a moment of inertia about an axis passing through one of its edges and perpendicular to the rod is _____.

A) $\frac{ML^2}{12}$

B) $\frac{ML^2}{6}$

C) $\frac{ML^3}{3}$

D) $\frac{ML^2}{3}$

17. **Assertion (A) :** Inertia force always acts through the centroid of the body and is directed opposite to the acceleration of the centroid.

Reason (R) : It has always a tendency to retard the motion.

A) Both A and R are individually true and R is the correct explanation of A.

B) Both A and R are individually true but R is NOT the correct explanation of A.

C) A is true but R is false.

D) A is false but R is true.

18. The perpendicular distance between the diameter of a semi - circular area to its centroid is given by _____

A) $3r / 8\pi$

B) $4r / 3\pi$

C) $3r / 4\pi$

D) $5r / 4\pi$

19. Water from a tank with a capacity of 18000 litres is to be lifted in 20 minutes by a pump through a height of 12 m. If the efficiency of the pump is 65%, the power of the pump will be _____ (Assume $g = 10\ m/s^2$).

A) 1170 W

B) 1800 W

C) 2160 W

D) 2000 W

20. The ratio of the depth of flow to the hydraulic radius for the most economical trapezoidal section, in open channel flow is _____.

A) 1.0

B) 2.0

C) 0.5

D) 1.2

21. Power loss in an orifice meter is _____ that in a venturi meter.

A) Less than

B) Same as

C) More than.

D) Data insufficient, cannot be predicted.

22. The surface tension in a soap bubble of 40 mm diameter, when the inside pressure is $2.5N/m^2$ above atmospheric pressure is _____.

A) 0.125 N/m

B) 0.0125 N/m

C) 1.25 N/m

D) 12.5 N/m

23. When the Mach number is less than unity, the flow is called _____.

A) Sub - sonic flow.

B) Sonic flow.

C) Super - sonic flow.

D) Hypersonic flow.

24. Flow rate in an open channel is more accurately measured using _____.

A) Rectangular notch.

B) Triangular notch.

C) Venturi.

D) Orifice.

25. Both Reynold's and Froude's numbers assume significance in one of the following examples :

A) Motion of submarine at large depths.

B) Motion of ship in deep seas.

C) Cruising of a missile in the air.

D) Flow over spillways.

26. The efficiency of an impulse turbine _____

A) May never be beyond 50% even theoretically.

B) May approach 100% for frictionless vanes.

C) May exceed 50% with inclined flat - plate vanes.

D) May approach 100% for hemispherical bucket vanes.

27. An error of 1 percentage in measuring the head of water over the crest of a rectangular weir, produces an error in the discharge which is equal to _____

A) 1.25%

B) 1.50%

C) 1.75%

D) 2.25%

28. The operating point of a pump installed in a pipeline is decided by _____.

A) The speed of the pump.

B) The opening of the delivery valve.

C) The length of the pipeline.

D) The system's characteristic.

29. Braking jet in an impulse turbine is used _____

A) To break the jet of water.

B) To bring the runner to rest in a short time.

C) To change the direction of the runner.

D) None of the options are valid.

30. The jet ratio is defined as the ratio of the _____

A) The diameter of the jet to the diameter of the Pelton wheel.

B) Velocity of jet to the velocity of Pelton wheel.

C) Diameter of the Pelton wheel to the diameter of the jet.

D) Velocity of the Pelton wheel to the velocity of the jet.

31. The specific speed from 160 to 500 rpm of a centrifugal pump indicates that the pump is

A) Slow speed with the radial flow at the outlet.

B) Medium speed with radial flow at the outlet.

C) High speed with the radial flow at outlet.

D) High speed with axial flow at the outlet.

32. A turbine develops 10000 kW under a head of 25 meters at 135 r.p.m. Its specific speed is _____ (SI Unit).

A) 175.4

B) 215.5

C) 241.5

D) 275.4

33. Dimensionless specific speed for Kaplan turbine is about _____

A) 0.9

B) 9.0

C) 90

D) 900

34. During an experiment on a hydraulic jump, in a rectangular open channel 0.5 m wide the depth of water changes from 0.2 m to 0.5 m. The discharge in the channel will be _____ (m^3/s).

A) 2.930

B) 0.293

C) 0.529

D) 0.067

35. Which type of pump is different from others in the same group?

A) Screw pump.

B) Gear pump.

C) Cam and piston pump.

D) Plunger pump.

36. Power transmitted through pipes will be maximum when _____

A) Head loss due to friction = ½ total head at inlet of the pipe.

B) Head loss due to friction = ¼ total head at inlet of the pipe.

C) Head loss due to friction = total head at inlet of the pipe.

D) Head loss due to friction = ⅓ total head at inlet of the pipe.

37. Manning and Chezy formulae are valid for _____.

A) Steady flow.

B) Steady uniform flow.

C) Steady non - uniform flow.

D) Unsteady uniform flow.

38. The strength of a jump is governed by the _____

A) Upstream velocity.

B) Downstream velocity.

C) Upstream froude number.

D) Bed slope.

39. For engineering materials, Poisson's ratio lies between

A) 0 and 1

B) -1 and +1

C) - 0.5 and + 0.5

D) 0 and + 0.5

40. For the tension test on a mild steel bar, arrange the sequence of material properties.

1. Yield point.
2. Limit of proportionality.
3. Breaking stress.
4. Ultimate stress.

Choose the correct option.

A) 2-1-3-4

B) 2-1-4-3

C) 1-2-4-3

D) 1-2-3-4

41. If the modulus of rigidity is 80 kN/mm^2 and the bulk modulus is 140 kN/mm^2, then the Poisson's ratio is

A) 0.20

B) 0.25

C) 0.26

D) 0.33

42. A cylindrical bar of 20 mm diameter and 1 m length is subjected to a tensile test. Its longitudinal strain is 4 times that of its lateral strain. If the modulus of elasticity is 2×10^5 N/mm^2, then its modulus of rigidity will be.

A) 8×10^6 N/mm^2

B) 8×10^5 N/mm^2

C) 0.8×10^4 N/mm^2

D) 0.8×10^5 N/mm^2

43. Match the following :

	Type of material	**Poisson's ratio**
1.	Concrete	P. 0
2.	Cork	Q. 0.15
3.	Rubber	R. 0.25
4.	Isotropic Materials	S. 0.33
		T. 0.50

Choose the correct option :

A) 1-Q, 2-P, 3-T, 4-S.

B) 1-Q, 2-P, 3-T, 4-R.

C) 1-R, 2-P, 3-T, 4-S.

D) 1-R, 2-T, 3-P, 4-S.

44. Choose the wrong statement.

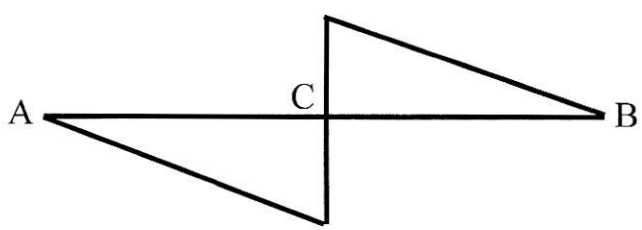
A) The shear force at any section of a beam is equal to the total sum of the forces acting on the beam on any one side of the beam.

B) The magnitude of the bending moment at any section of a beam is equal to the vector sum of moments (about the section) due to the forces acting on the beam on any one side of the beam.

C) A diagram that shows the values of shear forces at various sections of the structural member is called a shear force diagram.

D) The shear force diagram and bending moment diagram will be identical for a simply supported beam with a midspan couple.

45. In the bending moment diagram for simply supported beam is of the form given below, then the load acting on the beam is _____



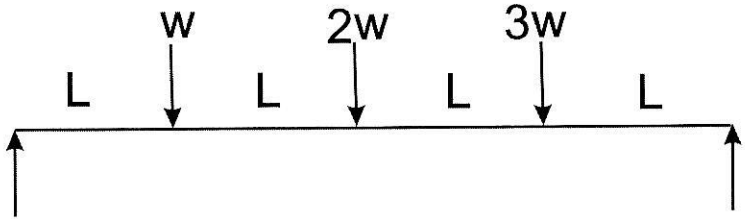
A) A concentrated force at point 'A'.

B) A uniformly distributed load over the whole length of the beam.

C) Equal and opposite moments applied at points 'A' and 'B'.

D) A moment applied at point 'C'.

46. The maximum shear force for a simply supported beam loaded as shown in the figure will be _____



A) Zero.

B) W

C) 2.5W

D) 3.5W

47. A thin cylinder with both ends closed is subjected to internal pressure p. The longitudinal stress at the surface has been calculated as σ_0. Maximum shear stress will be equal to_____.

A) $2\sigma_0$

B) $1.5\sigma_0$

C) σ_0

D) $0.5\sigma_0$

48. The shearing stress in a solid shaft is not to exceed 45N/mm^2 when the torque transmitted is 40,000 N-m. The minimum diameter of the shaft will be _____

A) 12.5 mm

B) 16.5 mm

C) 18.0 mm

D) 20.0 mm

49. A thin cylindrical shell of diameter 'd', length 'l' and thickness 't' is subjected to an internal pressure 'p', the ratio of longitudinal strain to hoop strain is ____.

A) pd/2t.

B) pd/2t(1-1/m).

C) (m-2)/(2m-1).

D) (2m-1)/(m-2).

50. Group I gives a list of test methods for evaluating the properties of aggregates.

Group II gives the list of properties to be evaluated.

	Group - I : Test Methods		**Group - II : Properties**
P.	Soundness Test	1.	Strength
Q.	Crushing Test	2.	Resistance to weathering
R.	Los Angeles Test	3.	Adhesion
S.	Stripping Value Test	4.	Hardness.

The correct match of test methods under Group - I to properties under Group - II is

A) P-4, Q-1, R-2, S-3.

B) P-2, Q-4, R-3, S-1.

C) P-2, Q-1, R-4, S-3.

D) P-3, Q-4, R-1, S-2.

51. Consider the following statements for air - entrained concrete :

i. Air entrainment reduces the water demand for a given level of workability.

ii. Use of air - entrained concrete is required in environments where cyclic freezing and thawing is expected.

Which of the following is TRUE?

A) Both (i) and (ii) are True.

B) Both (i) and (ii) are False

C) (i) is True and (ii) is False.

D) (i) is False and (ii) is True.

52. A thin cylindrical drum 100 cm in diameter and 10 m long has a shell thickness of 1 cm. The drum is subjected to an internal pressure of 400 N/cm^2, If $E = 2\times10^7$ N/cm^2 and Poisson's ratio = 0.3, then the circumferential strain will be _____.

A) 0.085×10^{-3}

B) 0.20×10^{-3}

C) 0.85×10^{-3}

D) 1.90×10^{-3}

53. A 3 m long prismatic shaft of 50 mm diameter restrained at its ends is subjected to a uniformly distributed torque of 12.6 kNm. If the rigidity modulus is 50 GPa, the maximum deformation of the shaft is _____.

A) 0.0053 degree

B) 0.053 degree

C) 0.53 degree

D) 5.3 degree.

54. A cylindrical vessel is said to be thin if the ratio of its internal diameter to the wall thickness is _____.

A) Less than 20

B) Equal to 20

C) More than 20

D) None of the above.

55. The torsional rigidity of a shaft is equal to _____.

A) Product of modulus of rigidity and polar moment of inertia.

B) Sum of modulus of rigidity and polar moment of inertia.

C) Difference of modulus of rigidity and polar moment of inertia.

D) Ratio of modulus of rigidity and polar moment in inertia.

56. A hollow circular shaft 2 m long is required to transmit 1000 kW power when running at a speed of 300 rpm. If the outer diameter of the shaft is 150 mm and the inner diameter is 120 mm, the strain energy stored in the shaft will be _____.

A) 26.32 Joules.

B) 81.36 Joules.

C) 31.81 Joules.

D) 61.43 Joules.

57. A Surveyor's steel tape 30 m long has a cross - section of 15 mm×0.75 mm. With this, line AB has been measured as 150 m. If the force applied during measurement is 120 N more than the force applied at the time of calibration, the elongated length of the tape will be _____.

A) 1.2 mm

B) 1.6 mm

C) 1.8 mm

D) 2.0 mm

58. In the Marshall method of mix design, the coarse aggregate, fine aggregate, fines, and bitumen having respective values of specific gravity 2.60, 2.70, 2.65, and 1.01, are mixed in the relative proportions (% by weight) of 55.0, 35.8, 3.7 and 5.5 respectively. The theoretical specific gravity of the mix and the effective specific gravity of the aggregates in the mix respectively are _____.

A) 2.42 and 2.63

B) 2.42 and 2.78

C) 2.42 and 2.93

D) 2.64 and 2.78

59. Gypsum is typically added in cement to _____.

A) Increase workability.

B) Prevent the quick setting.

C) Enhance hardening.

D) Decrease the heat of hydration.

60. The slenderness ratio of a 5 m long column hinged at both ends and having a circular cross - section with a diameter of 16 cm is _____.

A) 31.25

B) 62.50

C) 100

D) 125

61. If 'n' links are connected at the same point, the joint is equivalent to

A) (n-1) binary joints

B) (n-2) binary joints

C) (n-3) binary joints

D) (n-4) binary joints

62. Which of the following is an inversion of a double - slider crank chain?

A) Whitworth quick return mechanism.

B) Reciprocating engine.

C) Scotch yoke mechanism.

D) Rotary engine.

63. When a slider moves on a fixed link having a curved surface, its instantaneous centre lies?

A) On their point of contact.

B) At the centre of curvature.

C) At the centre of the circle.

D) At the pinpoint.

64. If a point moves along a straight line that is rotating, then the tangential component of acceleration is

Where, v = velocity of a point along the straight line

ω = angular velocity of the line

α = angular acceleration of the line

r = radius of the point.

V = tangential velocity of the line = ω r.

A) V^2 / r

B) $(dv / dt) - \omega^2 r$.

C) dv / dt

D) $2v\omega + r\alpha$

65. If the ratio of the length of the connecting rod to the crank increases,

A) Secondary unbalanced forces increase.

B) Secondary unbalanced forces decrease.

C) Primary unbalanced forces increase.

D) Primary unbalanced forces decrease.

66. In the case of involute gear teeth, the pressure angle is

A) Same at all points of contact.

B) Maximum at the engagement of teeth

C) Minimum at the engagement of teeth.

D) Zero at the pitch point.

67. The path of contact in the involute tooth profile is a _____

A) Parabola.

B) Circle.

C) Straight line.

D) Curve.

68. The radial distance of a tooth from the pitch circle to the bottom of the tooth is called

A) Dedendum.

B) Addendum.

C) Clearance.

D) Working depth.

69. If the axes of the first gear and the last gear of a compound gear train are coaxial, the gear train is known as

A) Simple.

B) Epicyclic.

C) Reverted

D) Compound.

70. The governor is said to be _____ when the speed of the engine fluctuates continuously above and below the mean speed.

A) Isochronous.

B) Hunting.

C) Insensitive.

D) Stable.

71. The power transmitted by a belt is maximum when the maximum tension in the belt is equal to.

A) T_c

B) $2T_c$

C) $3T_c$

D) $4T_c$

72. The frictional torque transmitted in a flat pivot bearing, considering uniform pressure is

Where μ = coefficient of friction.

W = load over the bearing, and

R = radius of the bearing surface.

A) $(1/2)\mu$ WR

B) $(2/3)\mu$ WR

C) $(3/4)\mu$ WR

D) μ WR

73. The retardation of a flat - faced follower when it has contact at the apex of the nose of a circular arc cam is given by

Where OQ = distance between the center of circular flank and centre of nose?

A) $\omega^2 \times OQ$

B) $\omega^2 \times OQ \sin\theta$

C) $\omega^2 \times OQ \cos\theta$

D) $\omega^2 \times OQ \tan\theta$

74. In a turning moment diagram, the variation of energy above and below the mean resisting torque line is called

A) Fluctuation of energy.

B) Maximum fluctuation of energy.

C) Coefficient of fluctuation of energy.

D) Range of energy.

75. In a radial cam, the follower moves.

A) In a direction perpendicular to the cam axis.

B) In a direction parallel to the cam axis.

C) In any direction irrespective to the cam axis.

D) Along the cam axis.

76. The swaying couple is maximum or minimum when the angle of inclination of the crank to the line of stroke is equal to

A) 45° and 135°

B) 90° and 135°

C) 135° and 225°

D) 45° and 225°

77. Discontinuous chips can form during the cutting of

A) Ductile materials.

B) Brittle materials.

C) Any material at high - cutting speed.

D) Any metal at a low depth of cut.

78. Ceramic cutting tools should be used with

A) Cutting fluid.

B) Low cutting speeds because of their brittleness.

C) Very high cutting speed.

D) Old machine tools.

79. Match list I with list II and select the correct answer using the codes given below the lists.

List - I (**tool wear**)	**List - II** (**related to**)
1. Corrosive wear	i. Thermo Mechanical Process
2. Adhesion wear	ii. Chemical wear
3. Fatigue wear	iii. Protruding particles
4. Abrasion wear	iv. Attrition wear

Codes.

	1	2	3	4
A)	ii	iv	iii	i
B)	ii	iv	i	iii
C)	iv	ii	i	iii
D)	ii	iii	iv	i

80. Which of the following operations can be regarded as a chipless operation?

A) Boring.

B) Reaming.

C) Milling.

D) Knurling.

81. Which one of the following processes is most commonly used for the forging of bolt heads of hexagonal shapes?

A) Closed die drop forging.

B) Open die upset forging.

C) Closed die press forging.

D) Open - die progressive forging.

82. Tandem drawing of wires and tubes is necessary because

A) It is not possible to reduce in one stage.

B) Annealing is needed between stages.

C) Accuracy in dimensions is not possible otherwise.

D) The surface finish improves after every drawing stage.

83. Consider the following advantages of powder metallurgy

1. Net - shaped object can be made
2. Wastage of materials is minimum.
3. Mechanical properties of the products are superior.
4. Uniform - density products are easily produced.

Of these statement

A) 2 and 3 are true.

B) 1 and 2 are true.

C) 3 and 4 are true.

D) 2 and 4 are true.

84. In powder metallurgy, the strength of the green compact is achieved by

A) Tempering.

B) Compressed tempering.

C) Sintering.

D) None of the above.

85. The metal extrusion process is generally used for producing.

A) Uniform solid sections.

B) Uniform hollow sections.

C) Uniform solid and hollow sections.

D) Improved physical property.

86. The following process provides the highest dimensional accuracy.

A) Cylindrical turning.

B) Jig boring.

C) Shaping

D) Milling.

87. Gang milling is used for

A) Large workpieces.

B) Small workpieces.

C) A number of milling cutters are used to cut simultaneously.

D) Only one milling cutter is used to cut heavy workpiece.

88. The machining operation used to enlarge an existing hole is termed.

A) Drilling.

B) Boring.

C) Counter sinking.

D) Reaming.

89. Neck formation shows after

A) Yield point.

B) Ultimate point.

C) Elastic point.

D) Failure point.

90. A measure of Rockwell hardness is the

A) Depth of penetration of indenter.

B) Surface area of indentation.

C) Projected area of indentation.

D) Height of rebound.

91. Shrinkage allowance on pattern is produced to compensate for shrinkage when

A) The temperature of liquid metal drops from pouring to freezing temperature.

B) The metal changes from liquid to solid state at freezing temperature.

C) The temperature at the solid phase drops from freezing to room temperature.

D) The temperature of metal drops from pouring to room temperature.

92. The time taken by an operator for the completion of the job in a given working condition is called as

A) Normal time.

B) Standard time.

C) Basic time.

D) Cycle time.

93. Which method study symbol is used when a dimension check is performed on an object?

A) 

B) 

C) 

D) 

94. Which among the following is not the applications of Micro motion study?

A) To study the relationship of the activities of the operator and the machine as a means of timing operations.

B) To obtain motion time data for time standards.

C) To act as a permanent record of the method and time of activities of the operator and the machine.

D) To do an effective comparison between different layouts or methods of doing the job.

95. Which among the following is not the principle of Design for Manufacturing and Assembly (DFMA)?

A) Use standard components and tools.

B) Simplify assembly.

C) Design products to be robust.

D) Use different components and parts.

96. If a tool breaks, the process of removing the tool from its holder and replacing it with a new one must be followed. A small amount of time can be added to a regular schedule to accommodate for delays or other justifiable work items. What kind of allowance is that?

A) Interference allowance.

B) Variable allowance.

C) Policy allowance.

D) Relaxation allowance.

97. A systematic approach to analysing the causes and effects of product failures and also anticipates failures and prevents them from occurring is called as

A) Failure Mode Effect and criticality Analysis.

B) Value Engineering.

C) Value Analysis.

D) Fault Tree Analysis.

98. Which of the following situations demand for the evaluation of make or buy decisions?

1. When the organisation introduces new products.
2. The constant demand for the company's products.
3. Deteriorating quality and delivery commitment of the supplier if presently the item is bought.

The correct answer/s is/are.

A) 3 only

B) 2 and 3 only

C) 1 and 3 only

D) 1, 2 and 3

99. Consider the following statements :

Assertion (A) : Proximity to market condition assumes added importance in selecting the location of the enterprise.

Reason (R) : If the products manufactured are fragile and susceptible to spoilage it is advisable to keep the manufacturing site closer to the market.

The correct answer is

A) A and R are both correct and R is the correct explanation of A.

B) A and R are both correct and R is NOT the correct explanation of A.

C) A is correct, but R is NOT correct.

D) A is NOT correct, but R is correct.

100. Identify the correct match :

	List - I		**List - II**
1.	Principle of integration	i.	Unites men, materials, machines supporting services, and others
2.	Principle of Flow	ii.	Lesser material handling equipment.
3.	Principle of Minimum Material Handling.	iii.	No backtracking
4.	Principle of Minimum distance	iv.	Lesser movement of man and materials.

Choose the correct option:

	i	ii	iii	iv
A)	1	2	3	4
B)	1	3	2	4
C)	2	1	4	3
D)	2	3	1	4

ROUGH WORK

ROUGH WORK