**COMMON P. G. ENTRANCE TEST – 2020**

**Test Booklet No. :**

# DEPT. OF HIGHER EDUCATION, GOVT. OF ODISHA

## TEST BOOKLET

**Subject Code** **32** **Subject** **MARINE SCIENCE (OCEANOGRAPHY)**

*Time Allowed :* ***90*** *Minutes* *Full Marks :* ***70***

**: INSTRUCTIONS TO CANDIDATES :**

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. You have to enter your **Hall Ticket No.** on the Test Booklet in the Box provided alongside. **DO NOT** write *anything else* on the Test Booklet.
3. **YOU ARE REQUIRED TO FILL UP & DARKEN HALL TICKET NO. & TEST BOOKLET NO. IN THE ANSWER SHEET AS WELL AS FILL UP TEST BOOKLET SERIAL NO. & ANSWER SHEET SERIAL NO. IN THE ATTENDANCE SHEET CAREFULLY. WRONGLY FILLED UP ANSWER SHEETS ARE LIABLE FOR REJECTION AT THE RISK OF THE CANDIDATE.**
4. **This Test Booklet contains 70 items (questions). Each item (question) comprises four responses (answers). You have to select the correct response (answer) which you want to mark (darken) on the Answer Sheet. In case, you feel that there is more than one correct response (answer), you should mark (darken) the response (answer) which you consider the best. In any case, choose ONLY ONE response (answer) for each item (question).**
5. You have to mark (darken) all your responses (answers) **ONLY** on the **separate Answer Sheet** provided by **using BALL POINT PEN (BLUE OR BLACK)**. See instructions in the Answer Sheet.
6. All items (questions) carry equal marks. All items (questions) are compulsory. Your total marks will depend only on the number of correct responses (answers) marked by you in the Answer Sheet. **There is no negative marking**.
7. **After you have completed filling in all your responses (answers) on the Answer Sheet and after conclusion of the examination, you should hand over to the Invigilator the *Answer Sheet* issued to you. You are allowed to take with you the candidate's copy / second page of the Answer Sheet along with the Test Booklet, after completion of the examination, for your reference.**
8. Sheets for rough work are appended in the Test Booklet at the end.

**DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO**

1. One stoke is equal to :

   (A) $10^{-4}$ $m^2/s$

   (B) $10^{-3}$ $m^2/s$

   (C) $10^{-2}$ $m^2/s$

   (D) $10^{-1}$ $m^2/s$

2. A satellite of mass m is revolving in a circular orbit around the earth of mass M. If E is its total mechanical energy, then its angular momentum is :

   (A) $\sqrt{(E / mr^2)}$

   (B) $E / (2mr^2)$

   (C) $(2 Emr^2)^{1/2}$

   (D) $\sqrt{(2Emr)}$

3. A satellite is orbiting a planet at a constant height in a circular orbit. If the mass of the planet is reduced to half, the satellite would :

   (A) Fall on the planet

   (B) Go to an orbit of higher radius

   (C) Escape from the planet

   (D) Go to an orbit of smaller radius

4. A man presses more weight on earth at :

   (A) Sitting position

   (B) Standing position

   (C) Lying position

   (D) None of these

5. Minimum distance between an object and real image of a convex lense is :

   (A) 4 < i > f < /i >

   (B) 3 < i > f < /i >

   (C) 2 < i > f < /i >

   (D) < i > f < /i >

6. The rotational effect of a force on a body about an axis of rotation is described in terms of the :

(A) Centre of gravity

(B) Centripetal force

(C) Centrifugal force

(D) Moment of force

7. If a lift is going up with acceleration, the apparent weight of a body is :

(A) More or less the true weight

(B) Equal to the true weight

(C) Less than the true weight

(D) More than the true weight

8. What is the value of Rydberg constant ?

(A) $1.0973 \times 10^{3}\ m^{-1}$

(B) $1.0973 \times 10^{5}\ m^{-1}$

(C) $1.0973 \times 10^{7}\ m^{-1}$

(D) $1.0973 \times 10^{9}\ m^{-1}$

9. Which of the following represents the angular momentum of an electron as per Bohr's model (h = Planck's constant) ?

(A) $h/\pi$

(B) $nh/2\pi$

(C) $2\pi nh$

(D) $\pi nh$

10. What is the relation between Time period (T) and angular frequency ($\omega$) of a wave ?

(A) $T = 2\pi/\omega$

(B) $T = 2\pi\omega$

(C) $T = \pi/2\omega$

(D) $T = \omega$

11. Which of the following represents the relationship between the Fahrenheit temperature and Celsius temperature ?

(A) tf = (tc x180)/100 – 32

(B) tf = (tc x100)/180 – 32

(C) tf = (tc x100)/180 + 32

(D) tf = (tc x 180)/100 + 32

12. What is the orbital velocity of geo stationary satellite ?

(A) 4.15 km/s

(B) 2.78 km/s

(C) 3.08 km/s

(D) 6.66 km/s

13. In which of the following states of matter the Interatomic or intermolecular distance is fixed ?

(A) Solids

(B) Liquids

(C) Gases

(D) Both (A) and (B)

14. The ratio of normal stress to the volumetric strain within the elastic limits is called as :

(A) Bulk Modulus

(B) Young Modulus

(C) Modulus of Rigidity

(D) None of the above

15. When two bodies, of different mass, are acted upon by the same force for the same time, then both bodies acquire the ?

(A) Same velocity

(B) Same momentum

(C) Same acceleration

(D) All of the above

16. Who among the following discovered X-rays ?

(A) Marie Curie

(B) J. J. Thomson

(C) W. C. Roentgen

(D) James Chadwick

17. Which of these branches of Physics deal with heat and temperature and their relation to energy and work ?

(A) Geophysics

(B) Mechanics

(C) Atomic Physics

(D) Thermodynamics

18. The device used to measure the flow speed of incompressible fluid is called as :

(A) Torri-meter

(B) Bernoulli-meter

(C) Hydro-meter

(D) Venturi-meter

19. Which of the following statements about Pressure and Stress is NOT correct ?

(A) Pressure is always normal to the area

(B) Pressure is always compressive in nature

(C) Stress can be normal or tangential to the area

(D) Stress is always compressive in nature

20. If A and B are matrices, then which from the following is true ?

(A) $A + B \neq B + A$

(B) $(At)t \neq A$

(C) $AB \neq BA$

(D) All are true

21. Let h be the finite difference, then forward difference operator is defined by _____.

(A) $f(x) = f(x + h) - f(x)$

(B) $f(x) = f(x - h) - f(x)$

(C) $f(x) = f(x*h)$

(D) $f(x) = f(x)$

22. The symbol used for shift operator :

(A) $\mu$

(B) E

(C) $\nabla$

(D) D

23. Which of the following is iterative method ?

(A) Guass-Jardan method

(B) Guass-Seidal method

(C) Guass-Elimination method

(D) Crout's method

24. Numerical solutions of linear algebraic equations can be obtained by :

(A) Euler's method

(B) Euler's modified method

(C) Ranga Kutta Method

(D) None of these

25. The parameter E which we use for least square method is called as _____.

(A) Sum of residues

(B) Residues

(C) Error

(D) Sum of error

26. Under property of equality of real numbers, $a = b$ then $b = a$ and $\forall a, b \in R$ is called :

(A) Symmetric property

(B) Additive property

(C) Transitive property

(D) Multiplicative property

27. For some integer n, the odd integer is represented in the form of :

(A) n

(B) $n + 1$

(C) $2n + 1$

(D) $2n$

28. The $n^{th}$ term of an A.P. is given by $a_n = 3 + 4n$. The common difference is :

(A) 7

(B) 3

(C) 4

(D) 1

29. If p, q, r and s are in A. P. then $r - q$ is :

(A) $s - p$

(B) $s - q$

(C) $s - r$

(D) None of these

30. Graphically, the pair of equations $7x - y = 5$ ; $21x - 3y = 10$ represents two lines which are :

(A) Intersecting at one point

(B) Parallel

(C) Intersecting at two points

(D) Coincident

31. Which of the following is not irrational ?

(A) $(2 - \sqrt{3})^2$

(B) $(\sqrt{2} + \sqrt{3})^2$

(C) $(\sqrt{2} - \sqrt{3})(\sqrt{2} + \sqrt{3})$

(D) $2\sqrt{7}/7$

32. The set A = {0,1, 2, 3, 4, …} represents the set of :

(A) Whole numbers

(B) Integers

(C) Natural numbers

(D) Even numbers

33. Mode is the :

(A) Middle most frequent value

(B) Least frequent value

(C) Maximum frequent value

(D) None of these

34. If u = xx + yy + zz, find du/ dx + du/ dy + du/ dz at x = y = z = 1 :

(A) 1 (B) 0

(C) 2u (D) u

35. What is the full form of W3C ?

(A) World Wide Web Consortium

(B) World Wide Web Company

(C) World Wide Web Center

(D) World Wide Web Command

36. Which among the following is NOT a search engine ?

(A) Google (B) Baidu

(C) Wolfram Alfa (D) Yahoo

37. One nibble is equal to :

(A) 4 Bits (B) 4 Bytes

(C) 8 Bytes (D) 8 Kilo Bytes

38. This part of the computer does all of the 'thinking'. It can carry out billions of instructions per second and gets very hot :

(A) Motherboard (B) Hard Drive

(C) Processor (D) RAM

39. The system unit of a personal computer typically contains which of the following ?

(A) Microprocessor (B) Disk Controller

(C) Serial Interface (D) All of the above

40. Which of the following is the smallest high-speed storage area in the CPU ?

(A) Control Unit

(B) ALU

(C) Hard Disk

(D) Register

41. Which of the following is the data storage device that is used to store very high-resolution video formats ?

(A) Blu Ray

(B) CD-ROM

(C) Floppy Drive

(D) Hard Disk

42. What is the full form of HVD ?

(A) Hydraulic Video Disk

(B) Halogenated Versatile Disk

(C) Holographic Versatile Disc

(D) Hyper Video Disk

43. What is the name given to the program in execution ?

(A) Process (B) Instruction

(C) Procedure (D) Function

44. What does the term SQALE stands for ?

(A) Software Questionable Assessment Lifecycle

(B) Software Quality Assessment based on Lifecycle Expectations

(C) Software Questions and Large-Scale Enquiry

(D) None of the above

45. Which of these is a server side scripting language ?

(A) HTML (B) Java script

(C) PHP (D) CSS

46. Which of these is not an MS Office web service ?

(A) Docs.com

(B) One Drive

(C) Drop box

(D) Delve

47. Hydrogen bomb is based on the principle of :

(A) Nuclear fission

(B) Nuclear fusion

(C) Natural radioactivity

(D) Artificial radioactivity

48. Identify the wrong statement in the following :

(A) Atomic radius of the elements increases as one moves down the first group of the periodic table

(B) Atomic radius of the elements decreases as one moves across from left to right in the 2nd period of the

(C) Amongst isoelectronic species, smaller the positive charge on the cation, smaller is the ionic radius

(D) Amongst isoelectronic species, greater the negative charge on the anion, larger is the ionic radius

49. Rare gases are :

(A) Mono atomic (B) Di atomic

(C) Tri atomic (D) None of above

50. An emulsifier is a substance which _____.

(A) Coagulates the emulsion

(B) Homogenises the emulsion

(C) Stabilises the emulsion

(D) Accelerates the dispersion of liquid in liquid

51. Identify the gas which is readily adsorbed by activated charcoal :

(A) $N_2$ (B) $O_2$

(C) $H_2$ (D) $SO_2$

52. Which of the following statements for order of reaction is not correct ?

(A) Order can be determined experimentally

(B) Order of a reaction is equal to the sum of the power of concentration terms in differential rate law

(C) It is not affected with the stoichiometric coefficients of the reactants

(D) Order cannot be fractional

53. A reaction involving two different reactants can never be :

(A) Unimolecular reaction

(B) First order reaction

(C) Second order reaction

(D) Bimolecular reaction

54. Washing soda is :

(A) Sodium sulphite (B) Sodium bicarbonate

(C) Sodium carbonate (D) Sodium biosulphite

55. Who proposed first atomic theory ?

(A) E. Rutherford (B) De Broglie

(C) John Dalton (D) D.I. Mendeleef

56. Which one of the following is not used to dope a semiconductor ?

(A) Al (B) B

(C) In (D) Au

57. The metallurgical process in which a metal is obtained in a fused state is called :

(A) Smelting (B) Roasting

(C) Calcinations (D) Froth floatation

58. The number of waves in n x 10th Bohr's orbit is :

(A) $n^2$ (B) n

(C) $n^{-2}$ (D) $n^3$

59. Drifting of continents started during which period :

(A) Permian (B) Devonian

(C) Cambrian (D) Carboniferous

60. The term "Isostasy" is not related with :

(A) Drifting (B) Balance

(C) Euipoise (D) Gravity

61. Trenches are the site of :

(A) Massive folding

(B) No currents are present at trenches

(C) Diverging currents

(D) Converging currents

62. The geochemical classification of the elements was done by :

(A) Eskola (B) Goldschmidt

(C) Barth (D) Clarke

63. Which were the predominant flora in the Gondwana time ?

(A) Angiosperms and Spermatophyte

(B) Pteridophytes

(C) Gymnosperms

(D) Both Pteridophytes and Gymnosperms

64. Process of folding in which the competent rocks are thrown into fold due to their sliding against each other under the influence of lateral compression are called :

(A) Drag folding (B) Flexural folding

(C) Shear folds (D) Flow folds

65. The acceleration due to gravity (g) begins to fall sharply towards the centre of the Earth from the _____ discontinuity.

(A) Conrad (B) Mohorovicic

(C) Gutenberg (D) Lehmann

66. Which of the following can be helpful in telling us the age of a sedimentary rock ?

(A) The type of fossils that it contains

(B) The composition of the minerals in the rock

(C) The roundness of the grains in the rock

(D) All of the above

67. What difference is there between the composition of Lava and Magma ?

(A) Magma contains dissolved gases and lava does not

(B) Magma is solid and lava is a liquid

(C) Lava is solid and magma is a gas

(D) None of the above

68. Which of the following is not a way that rivers transport sediment ?

(A) Saltation (B) Subduction

(C) Suspension (D) All of the above

69. Calcium carbonate, dissolved in water, may be deposited as limestone by :

(A) Living organisms

(B) Glaciers

(C) Erosion

(D) None of the above

70. The age of the Earth is approximately about :

(A) 4,600 trillion years

(B) 4,600 billion years

(C) 46 thousand years

(D) 4.6 billion years

## SPACE FOR ROUGH WORK