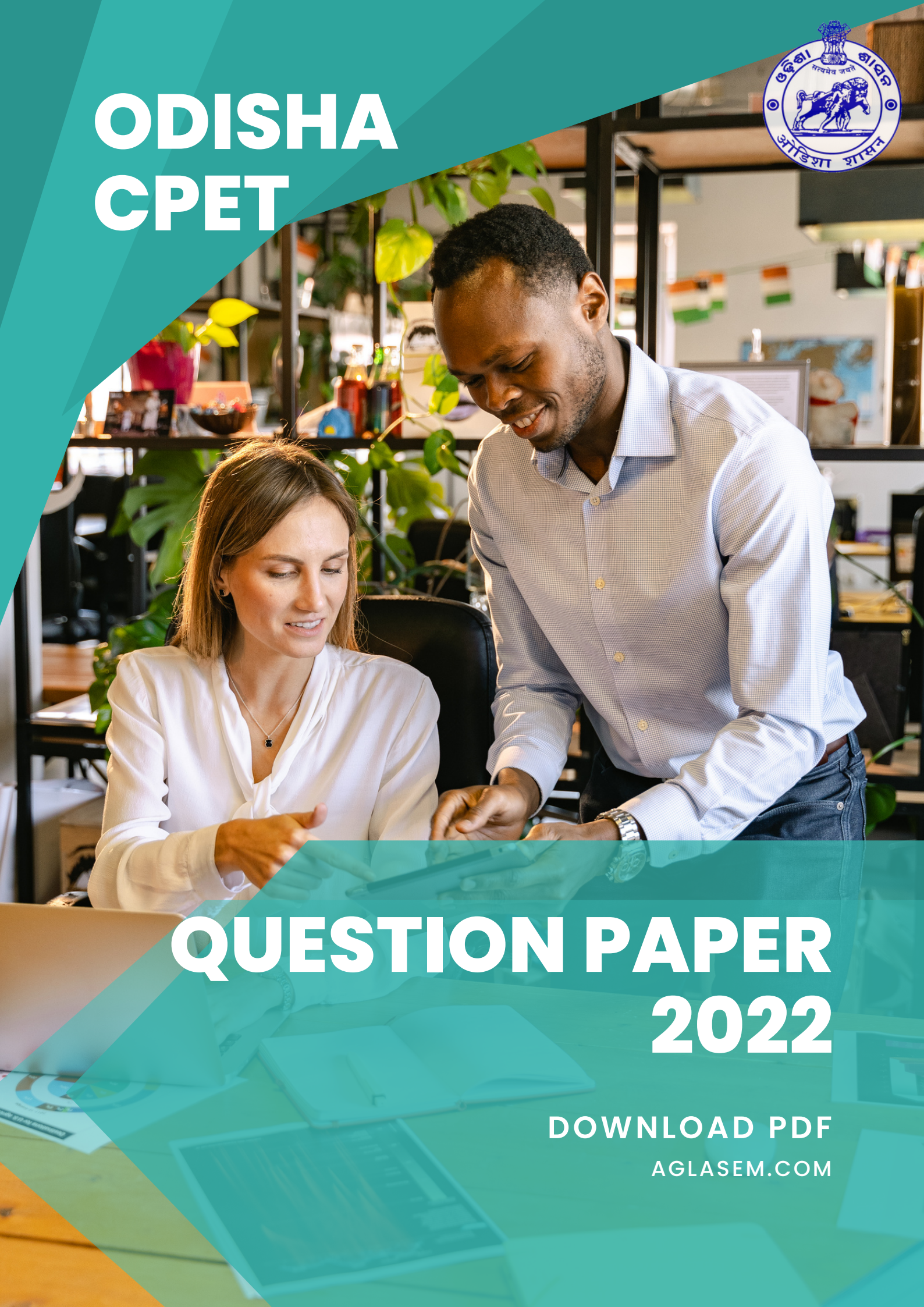
ODISHA CPET



QUESTION PAPER 2022

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COMMON P.G. ENTRANCE TEST–2022 (CPET-2022)

Subject Code : **55**

Test Booklet No.:

Entrance Subject : **Marine Science-Oceanography**

Hall Ticket No.:

TEST BOOKLET

Time Allowed : **90** Minutes

Full Marks : **70**

INSTRUCTIONS TO CANDIDATES

1. **Please do not open this Question Booklet until asked to do so.**
2. Check the completeness of the Question Booklet immediately after opening.
3. Enter your **Hall Ticket No.** on the Test Booklet in the box provided alongside. **Do not** write anything else on the Test Booklet.
4. Fill up & darken Hall Ticket No. & Test Booklet No. in the OMR Answer Sheet as well as fill up Test Booklet Serial No. & OMR Answer Sheet Serial No. in the Attendance Sheet carefully. Wrongly filled up OMR Answer Sheets are liable for rejection.
5. Each question has four answer options marked (A), (B), (C) & (D).
6. Answers are to be marked on the Answer Sheet, which is provided separately.
7. Choose the most appropriate answer option and darken the oval completely, corresponding to (A), (B), (C) or (D) against the relevant question number.
8. Use only **Blue/Black Ball Point Pen** to darken the oval for answering.
9. Please do not darken more than one oval against any question, as scanner will read such markings as wrong answer.
10. **Each question carries equal marks. There will be no negative marking for wrong answer.**
11. **Electronic items such as calculator, mobile, etc., are not permitted inside the examination hall.**
12. Don't leave the examination hall until the test is over and permitted by the invigilator.
13. **The candidate is required to handover the original OMR sheet to the invigilator and take the question booklet along with the candidate's copy of OMR sheet after completion of the test.**
14. Sheet for rough work is appended in the Test Booklet at the end.

1. The direction of rotation of the earth on its axis is from

(A) North to South

(B) South to North

(C) West to East

(D) East to West

2. 'Green House Effect' means"

(A) Pollution in house in tropic regions

(B) Trapping of solar energy due to atmospheric oxygen

(C) Trapping of solar energy due to atmospheric carbon-di-oxide

(D) Cultivation in green houses so as to check pollution

3. Which of the following is correct about Kinetic energy during the projectile motion?

(A) it is minimum at the point of projection

(B) it is minimum at the highest point

(C) it is maximum at the highest point

(D) it is minimum at the point of reaching the ground

4. The energy radiating from the earth surface in form of:

(A) Short wave

(B) Long wave

(C) Medium wave

(D) Micro wave

5. The dividing line between day and night is called the

(A) Prime Meridian

(B) Standard Meridian

(C) International Date Line

(D) Circle of Illumination

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6. 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

7. 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

8. 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

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

(A) h/π

(B) $nh/2\pi$

(C) $2\pi nh$

(D) $\prod nh$

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

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

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

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

(D) $T = \omega$

11. 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

12. Which of the following is iterative method?

(A) Guass Jardan method

(B) Guass Seidal method

(C) Guass-Elimination method

(D) Crout's method

13. 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

14. 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

15. 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

16. From an initially full bucket, water is dripping continuously from the bottom. The centre of mass of the bucket with water

(A) remains stationary

(B) moves upward all the way

(C) moves downward all the way

(D) moves downward first and then moves up

17. 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) √ (E / mr2)

(B) E / (2mr2)

(C) (2 Emr2)1/ 2

(D) √ (2Emr)

18. 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

19. In which of the following conditions, the total linear momentum of the system remains constant?

(A) If the resultant external force acting on the system of particles is zero

(B) If the resultant external force acting on the system of particles is positive

(C) If the resultant external force acting on the system of particles is -ve

(D) None of these

20. 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)

21. 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

22. 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

23. 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

24. Which of the following is INCORRECT for the matrix $M = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$

(A) It is its own inverse

(B) It is its own transpose

(C) It is non-orthogonal

(D) It has eigen values ± 1

25. The gradient of scalar field S (x, y, z), has the following characteristic(s)

(A) Line integral of a gradient is path-independent

(B) Closed line integral of a gradient is one

(C) Gradient of S is a measure of the minimum rate of change in the field S

(D) Gradient of S is a scalar quantity The product PQ of any two real, symmetric matrices P and Q is

26. The product PQ of any two real, symmetric matrices P and Q is

(A) symmetric for all P and Q

(B) never symmetric

(C) symmetric, if PQ =QP

(D) anti-symmetric for all P and Q

27. The solution of the differential equation $\left(\frac{dy}{dx}\right)^2 - \frac{d^2y}{dx^2} = e^y$, with the boundary conditions y(0)=0 and y'(0)=-1, is

(A) $-\ln\left(\frac{x^2}{2} + x + 1\right)$

(B) $-x\ln(e+x)$

(C) $-x_e^{-x^2}$

(D) $-x(x+1)e^{-x}$

28. Rank of the matrix A =

$$\begin{bmatrix} 0 & 0 & 0 & 0 \\ 4 & 2 & 3 & 0 \\ 1 & 0 & 0 & 0 \\ 4 & 0 & 3 & 0 \end{bmatrix}$$

(A) 0

(B) 1

(C) 2

(D) 3

29. What is the refractive index of water?

(A) 1

(B) 1.01

(C) 1.33

(D) 1.78

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. Eigen values of a real symmetric matrix are always

(A) Positive

(B) real and imaginary

(C) negative

(D) real

33. 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

34. Mode is the

(A) Middle most frequent value

(B) Least frequent value

(C) Maximum frequent value

(D) None of these

35. Which of these pairs has the same unit of measurement?

(A) Rate of flow and Acceleration

(B) Impulse and Moment of Force

(C) Rydberg constant and Gas constant

(D) Pressure and Coefficient of Elasticity

36. 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

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

(A) Google

(B) Baidu

(C) Wolfram Alfa

(D) Yahoo

38. Drifting of continents started during which period

(A) Permian

(B) Devonian

(C) Cambrian

(D) Carboniferous

39. One nibble is equal to _____

(A) 4 Bits

(B) 4 Bytes

(C) 8 Bytes

(D) 8 Kilo Bytes

40. 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

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

(A) Blu Ray

(B) CD-ROM

(C) Floppy Drive

(D) Hard Disk

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

(A) Docs.com

(B) One Drive

(C) Drop box

(D) Delve

43. 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

44. Rare gases are

(A) Mono atomic

(B) Di atomic

(C) Tri atomic

(D) None of above

45. Which is the first member of Alkyne series?

(A) Methyne

(B) Acetylene

(C) Propyne

(D) Ethene

46. 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

47. What is the name of the large supercontinent that existed 200 million years ago when all of the continents were together?

(A) San Andreas

(B) Andian

(C) Indian

(D) Pangaea

48. A reaction involving two different reactants can never be

(A) Unimolecular reaction

(B) First order reaction

(C) Second order reaction

(D) Bimolecular reaction

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

(A) n

(B) n+1

(C) 2n+1

(D) 2n

50. Which of these is NOT a compound of carbon?

(A) Acetic acid

(B) Chloroform

(C) Caustic Soda

(D) Methane

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

(A) Al

(B) B

(C) In

(D) Au

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

(A) n2

(B) n

(C) n-2

(D) n3

53. Which of the following is a non metal that remains liquid at room temperature?

(A) Chlorine

(B) Phosphorous

(C) Bromine

(D) Helium

54. Identify the correct group of Hydrocarbons in order of decreasing boiling point.

(A) Paraffin > Octadecane > Neohexane > Hexane > Ethane

(B) Paraffin > Octadecane > Hexane > Neohexane > Ethane

(C) Hexane > Paraffin > Octadecane > Neohexane > Ethane

(D) None of the above

55. Hydrogen bomb is based on the principle of

(A) Nuclear fission

(B) Nuclear fusion

(C) Natural radioactivity

(D) Artificial radioactivity

56. Trenches are the site of

(A) Massive folding

(B) No currents are present at trenches

(C) Diverging currents

(D) Converging currents

57. 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

58. 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

59. Which of the following is true?

(A) $\sqrt{2}+\sqrt{5}=\sqrt{7}$

(B) $\sqrt{2}+\sqrt{5} \leq \sqrt{7}$

(C) $\sqrt{2}+\sqrt{5}<\sqrt{7}$

(D) $\sqrt{2}+\sqrt{5} > \sqrt{7}$

60. Arrange the elements Fe, O, H, He, Si in decreasing order of their abundance in the solar system.

(A) H > He > O > Si > Fe

(B) He > H > Si > O > Fe

(C) H > He > O > Fe > Si

(D) Si > Fe > H > He > O

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61. We get Lehmann discontinuity at an approximate depth of:

(A) 100 km

(B) 750 km

(C) 450 km

(D) 220 km

62. The gently sloping land part that remains partly submerged under seawater is _____

(A) Continental shelf

(B) Continental bench

(C) Beach

(D) Continental slope

63. Charles Darwin classified coral reefs into how many classes?

(A) 2

(B) 3

(C) 4

(D) 5

64. The type of erosion which involves rubbing, grinding is _____

(A) Deflation

(B) Attrition

(C) Deflection

(D) Wind abrasion

65. Chemical formula of Rust is

(A) $Fe_2O_3 . nH_2O$

(B) $Fe_2Cl_3 . nH_2O$

(C) $FeCO_2 . nH_2O$

(D) $FeO . nH_2O$

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

(A) Angiosperms and Spermatophyte

(B) Pteridophytes

(C) Gymnosperms

(D) Both Pteridophytes and Gymnosperms

67. The type of reefs that occur from a distance of shore and have flat-topped ridges are_____

(A) Fringing reefs

(B) Barrier reefs

(C) Atolls

(D) Deposited reefs

68. 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

69. The stress developed in the top layers of the rocks which disintegrate due to repeated variations in temperatures is _____

(A) Tensile stress

(B) Compressive stress

(C) Shear stress

(D) Bending stress

70. Electrostatic forces stronger by _____ than the Gravitational Forces for a fixed distance?

(A) 102

(B) 1036

(C) 1012

(D) 2

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ROUGH WORK

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