

**OPENNET – VI : Entrance Test for
Diploma in Nautical Science leading to B.Sc. (Nautical Science)
June, 2007**

Total No. of Questions = 100

Time : 3 Hours

- All questions are compulsory.
- Use of calculator is **not** allowed. Rough work may be done in the space provided at the back of the Test booklet.
- The Test booklet has the following 5 tests :

Tests	No. of Questions	Marks
I – Reasoning Aptitude	20	20
II – General Knowledge	20	20
III – Mathematics	20	20
IV – English	20	20
V – General Science	20	20

Read the instructions given on the OMR Answer Sheet carefully before you start.

HOW TO FILL UP THE INFORMATION ON THE ENTRANCE TEST OMR ANSWER SHEET

While filling up the OMR Answer Sheet, you should follow the following guidelines :

1. Write your complete Roll Number. This should correspond to the roll number already supplied to you. Also write your correct name, address with pin code in the space provided, in ink. Put your signatures on the Answer Sheet with date, in ink. Ensure that the Invigilator in your examination hall also puts his signatures with date on the OMR Answer Sheet at the space provided. You should use HB pencil to mark the answers of the questions on the OMR Answer Sheet.
2. Do not make any stray marks on the OMR Answer Sheet.
3. Write correct information in numerical digits in Roll No., Programme Code, Date and Month and Examination Centre Code Columns. **The column of Course Code should be left blank.** The corresponding rectangle should be dark enough and should be filled in completely.
4. Each question is followed by four probable answers which are numbered 1, 2, 3 and 4. You should select and show only one answer to each question considered by you as the most appropriate or the correct answer. Select the most appropriate answer. Then by using HB pencil, blacken the rectangle bearing the correct answer number against the serial number of the question. **If you find that answer to any question is none of the four alternatives given under the question you should darken the rectangle '0'.**
5. If you wish to change your answer, ERASE completely the already darkened rectangle by using a good quality eraser and then blacken the rectangle bearing your revised answer number. If incorrect answer is not erased completely, smudges will be left on the erased rectangle and the question will be read as having two answers by the Optical Mark Reader (OMR) and will be ignored for giving any credit.
6. No credit will be given if more than one answer is given for one question. Therefore, you should select the most appropriate answer.
7. You should not spend too much time on any one question. If you find any particular question difficult, leave it and go to the next. If you have time left after answering all the questions, you may go back to the unanswered ones.
8. There is no negative marking for wrong answers.

GENERAL INSTRUCTIONS

1. Mobile Phones, calculators, books, slide-rules, foot rulers, note-books or written notes, etc. are not allowed inside the examination hall.
2. You should follow the instructions given by the Centre Superintendent, observers and by the Invigilators at the examination venue. If you violate the instructions you will be disqualified.
3. Any candidate found copying or receiving or giving assistance in the examination will be disqualified.
4. The Test Booklet and the OMR Answer Sheet would be supplied to you by the Invigilators. **After the exam is over, you should hand over the Test Booklet and the OMR Answer Sheet to the Invigilator before leaving the examination hall.** Any candidate who does not return the Question Booklet and the OMR Answer Sheet will be disqualified.
5. Candidates arriving late will not be permitted to enter the examination hall. The reporting time is 9.15 A.M. The examination will start at 10.00 A.M. and will be over at 1.00 P.M.
6. All rough work is to be done on the test booklet itself and not on any other paper. Scrap paper is not permitted. For arriving at answers you may work in the margins, make some markings or underline in the test booklet itself.
7. The University reserves the right to cancel scores of any candidate who impersonates or uses malpractices. The examination is conducted under uniform conditions. The University would also follow a procedure to verify the validity of scores of all examinees uniformly. If there is substantial indication that your performance is not genuine, the University may cancel your score.

TEST I

REASONING APTITUDE

1. If CAT is coded as 24, what will be the code number for BAT ?
- (1) 32 (2) 21
(3) 23 (4) 42
2. In the series given below count each 9 which is preceded by 2 and not followed by 5. How many such 9's are there ?
- 2 9 5 5 9 5 2 2 9 5 7 2 9 1 5 9 2 7 2 9 5 2 2 9 4 1 9 5
- (1) 1 (2) 2
(3) 3 (4) 4
3. The number of boys in a class is five times the number of girls. Which of the following numbers **cannot** represent the total number of children in the class ?
- (1) 24 (2) 30
(3) 42 (4) 45
4. $2 + 3 - 4 + 2 + 3 - 4 + 2 + 3 - 4 + \dots$
The sum of the 102 terms of the above series is
- (1) 102 (2) 0
(3) 34 (4) 2
5. A man is facing north-west. He turns 90° in the clockwise direction and then 135° in the anticlockwise direction. Which direction is he facing now ?
- (1) West
(2) East
(3) North-East
(4) South

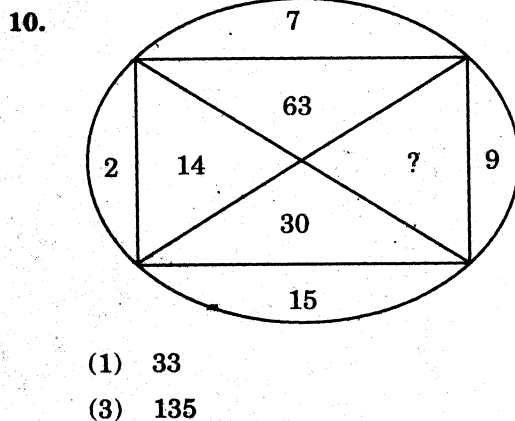
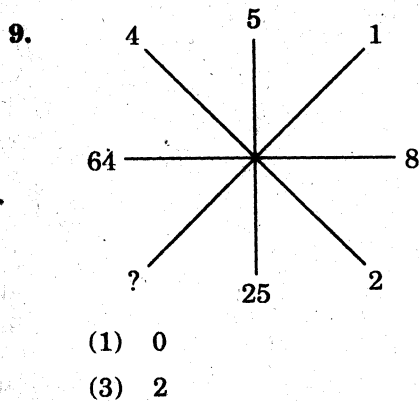
Directions for Questions 6 - 8 : Read the following information and answer the questions that follow.

From exactly seven people – R, S, T, U, X, Y and Z – a group of exactly four must be selected in accordance with the following conditions :

- (i) If R is selected, T must also be selected.
- (ii) If S is selected, U must also be selected.
- (iii) If X and Y are both selected together, T cannot be selected.

6. If X and Y are both selected together, which of the following must also be selected ?
- | | |
|-------|-------|
| (1) R | (2) S |
| (3) U | (4) Z |
7. If S and Z are both selected, each of the following could also be selected *except*
- | | |
|-------|-------|
| (1) R | (2) T |
| (3) U | (4) X |
8. If U is not selected, which of the following can be, but does **not** have to be, selected ?
- | | |
|-------|-------|
| (1) R | (2) S |
| (3) T | (4) X |

Directions for Questions 9 - 10 : Find the missing number:



Directions for Questions 11 – 14 : Study the following information.

A blacksmith has five iron articles A, B, C, D and E, each having a different weight.

- (i) A weighs twice as much as B.
- (ii) B weighs four and a half times as much as C.
- (iii) C weighs half as much as D.
- (iv) D weighs half as much as E.
- (v) E weighs less than A but more than C.

11. Which of the following is the lightest in weight ?

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

12. E is lighter in weight than which of the other two articles ?

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

13. E is heavier than which of the following two articles ?

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

14. Which of the following articles is the heaviest ?

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

Directions for Questions 15 – 16 : Find the missing number in the series.

15. 3, 6, 18, 72, _____

- (1) 144
- (2) 216
- (3) 288
- (4) 360

16. $\frac{2}{\sqrt{5}}, \frac{3}{5}, \frac{4}{5\sqrt{5}}, \frac{5}{25}, \text{_____}$

- (1) $\frac{6}{5\sqrt{5}}$
- (2) $\frac{6}{25\sqrt{5}}$
- (3) $\frac{6}{125}$
- (4) $\frac{7}{25}$

17. Choose the group which is different from the others.

- (1) 71, 7, 3, 17
- (2) 67, 71, 3, 5
- (3) 37, 14, 19, 7
- (4) 41, 5, 3, 47

Directions for Questions 18 – 20 : Answer the questions based on the following information.

- (i) Six persons – A, B, C, D, E and F – are sitting around a circular table facing the centre.
- (ii) C is sitting between A and F.
- (iii) B is sitting two places to the left of E.
- (iv) D is sitting two places to the right of F.

18. Between which two persons is D sitting ?

- (1) F, B
- (2) E, B
- (3) C, B
- (4) A, B

19. Who, among the following, is A's neighbour on his right ?

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

20. Between which two persons is F sitting ?

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

TEST II
GENERAL KNOWLEDGE

- 21.** Which city will host the 2012 Summer Olympics ?
- (1) Paris
 - (2) London
 - (3) New Delhi
 - (4) Beijing
- 22.** What is the full form of BPO ?
- (1) Below Poverty Operations
 - (2) Business Partner Outsourcing
 - (3) British Petroleum Organization
 - (4) Business Process Outsourcing
- 23.** Which Indian has served the longest period as President of India ?
- (1) Dr. Rajendra Prasad
 - (2) Dr. S. Radhakrishnan
 - (3) Giani Zail Singh
 - (4) V.V. Giri
- 24.** Who was the first Indian to win an Oscar ?
- (1) Satyajit Ray
 - (2) Raj Kapoor
 - (3) Bhanu Athaiya
 - (4) Guru Dutt
- 25.** Which country has the greatest oil reserves ?
- (1) Iran
 - (2) Canada
 - (3) Kuwait
 - (4) Saudi Arabia
- 26.** Which is the world's largest archipelago ?
- (1) Malaysia
 - (2) Indonesia
 - (3) Maldives
 - (4) Greenland

27. Who was the only President of U.S.A. who went on to serve on the U.S. Supreme Court as Chief Justice ?
- (1) William Taft
 - (2) F.D. Roosevelt
 - (3) Grover Cleveland
 - (4) George Washington
28. Which of the following places was known as a centre of learning in ancient India ?
- (1) Ujjain
 - (2) Nalanda
 - (3) Allahabad
 - (4) Delhi
29. The planet nearest to the Sun is
- (1) Mars
 - (2) Venus
 - (3) Mercury
 - (4) Earth
30. Who is known as the 'Iron Man of India' ?
- (1) Jawaharlal Nehru
 - (2) Sardar Vallabhbhai Patel
 - (3) Bal Gangadhar Tilak
 - (4) Mahatma Gandhi
31. Where was Albert Einstein born ?
- (1) U.K.
 - (2) U.S.A.
 - (3) Germany
 - (4) Italy
32. The French Revolution began with the storming of the Bastille in the year
- (1) 1789
 - (2) 1819
 - (3) 1901
 - (4) 1779
33. In which country is a national holiday celebrated on the third Monday of September called 'Respect for the Aged Day' ?
- (1) U.S.A.
 - (2) China
 - (3) Australia
 - (4) Japan

34. Which is the first individual event in which an Indian won an Olympic medal ?
- (1) Wrestling
 - (2) Long Jump
 - (3) Tennis
 - (4) Boxing
35. Who captained India in the first two Cricket World Cups ?
- (1) B.S. Bedi
 - (2) S. Venkatraghavan
 - (3) Sunil Gavaskar
 - (4) Ajit Wadekar
36. What is the full form of Wi Fi ?
- (1) Wired Fidelity
 - (2) Wise Fiction
 - (3) Wireless Fiction
 - (4) Wireless Fidelity
37. Which was the first organ to be transplanted successfully in humans ?
- (1) Heart
 - (2) Liver
 - (3) Kidney
 - (4) Lung
38. What is the currency of Mexico ?
- (1) Riyal
 - (2) Peso
 - (3) Krona
 - (4) Krone
39. The second-largest continent in terms of area is
- (1) Asia
 - (2) Africa
 - (3) North America
 - (4) South America
40. Movement of the Earth round the Sun is called
- (1) Revolution
 - (2) Rotation
 - (3) Circulation
 - (4) Spinning

TEST III

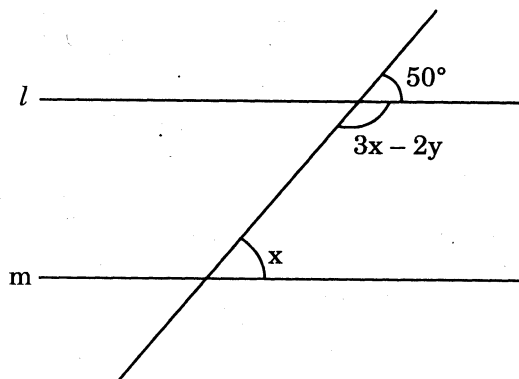
MATHEMATICS

41. If the mean of the data
5, 7, 9, 11, x, 12, 6, 9,
is 8, then the value of x is
(1) 5 (2) 6
(3) 9 (4) 8
42. The perimeter of a rectangle is 70 m. If its width is three-fourth of its length, then its area is
(1) 300 m^2 (2) 150 m^2
(3) 400 m^2 (4) None of these
43. The difference between the least perfect square number of four digits and the next perfect square number is
(1) 64 (2) 65
(3) 81 (4) 100
44. If $x^p = y$ and $y^q = z$, then x is equal to
(1) z^{pq} (2) $(z^p)^{1/q}$
(3) $(z^q)^{1/p}$ (4) $\frac{1}{z^{pq}}$
45. If the sides of two squares are in the ratio 3 : 2, their perimeters are in the ratio
(1) 3 : 2 (2) 2 : 3
(3) 9 : 4 (4) 4 : 9
46. If $2x + \frac{1}{2x} = 5$, then $4x^2 + \frac{1}{4x^2} = \dots$
(1) 25 (2) 23
(3) 27 (4) None of these
47. $\sqrt{0.000025} =$
(1) 0.05 (2) 0.005
(3) 0.0005 (4) 0.00005
48. A purse contains 4 copper coins and 3 silver coins, the second purse contains 6 copper coins and 2 silver coins. A coin is taken out of any purse. The probability that it is a copper coin is
(1) $\frac{4}{7}$ (2) $\frac{3}{4}$
(3) $\frac{3}{7}$ (4) $\frac{37}{56}$

49. If $25 \times (\sqrt{5})^k \times (\sqrt{5})^3 = 5\sqrt{5}$, then the value of k is

- (1) -4 (2) 3
(3) 4 (4) 5

50. In the following figure $\bar{l} \parallel \bar{m}$. Then y is equal to



- (1) 5° (2) 10°
(3) 190° (4) 60°

51. The value of $(27^{-2/3})^{1/2}$ is equal to

- (1) 3 (2) $1/3$
(3) $3^{-1/3}$ (4) 9

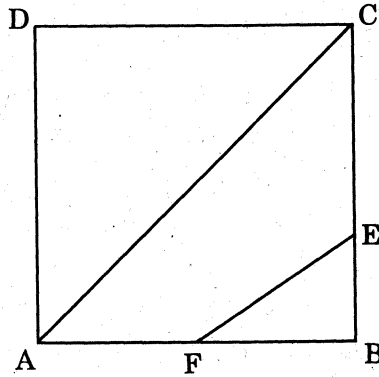
52. If $\begin{vmatrix} a & b \\ c & d \end{vmatrix} = a \times d - b \times c$, then $\begin{vmatrix} -3 & 5 \\ 6 & 7 \end{vmatrix}$ is equal to

- (1) +51 (2) -51
(3) -9 (4) +9

53. If two sides of a right-angled triangle are $2n$, $2n - 1$, then for $n = 2$, its hypotenuse is

- (1) $\frac{2n+1}{2}$ (2) $n^2 + 1$
(3) $\frac{n^2+1}{2}$ (4) $\frac{n^2-1}{2}$

54. In the following figure, $AF = \frac{1}{2} AB$, $BE = \frac{1}{3} BC$, $AC = 36\sqrt{2}$. Then area of ΔBEF is



- (1) 72 cm^2 (2) 144 cm^2
 (3) 108 cm^2 (4) $216\sqrt{2} \text{ cm}^2$
55. What percent of 6.25 is 1.25 ?
 (1) 10% (2) 15%
 (3) 20% (4) 25%
56. How many terms are there in the AP,
 7, 11, 15, ..., 139 ?
 (1) 16 (2) 17
 (3) 34 (4) 35
57. The value of $\cos^2 \theta + \frac{1}{(1 + \cot^2 \theta)}$ is
 (1) $\sin^2 \theta$ (2) $\cos^2 \theta$
 (3) 1 (4) $\tan^2 \theta$
58. The value of
 $2 \sin^2 30^\circ - 3 \cos^2 45^\circ + \tan^2 60^\circ$ is
 (1) 1 (2) 2
 (3) 3 (4) 4
59. A vertical pole stands on level ground. From a point on the ground, 25 m away from the foot of the pole, the angle of elevation of its top is found to be 60° . Then the height of the pole is
 (1) $\frac{25}{\sqrt{3}} \text{ m}$ (2) 25 m
 (3) $25\sqrt{2} \text{ m}$ (4) $25\sqrt{3} \text{ m}$
60. If the distance between the points A(k, -5) and B(2, 7) is 13 units, then the value of k will be
 (1) 3 or -7 (2) -3 or 7
 (3) 3 or 7 (4) -3 or -7

TEST IV

ENGLISH

Directions for Questions 61 – 65 : Read the passage given below and answer the questions given at the end of the passage, on the basis of the contents of the passage.

In its loosest sense, thinking signifies everything that, as we say, is “in our heads” or that “goes through our minds.” He who offers a “penny for your thoughts” does not expect to drive any great bargain. In calling the object of his demand ‘thoughts’, he does not intend to ascribe to them — dignity, consecutiveness, or truth. Any idle fancy, trivial recollection, or flitting impression will satisfy his demand. Daydreaming, building of castles in the air, that loose flux of casual and disconnected material that floats through our minds in relaxed moments are, in this random sense, thinking. More of our waking life than we should care to admit, even to ourselves, is likely to be whiled away in this inconsequential trifling with idle fancy and unsubstantial hope.

In this sense, silly folk and dullards think. The story is told of a man in slight repute for intelligence, who desiring to be chosen selectman in his New England town, addressed a knot of his neighbours in this way : “I hear you don’t believe I know enough to hold office. I wish you to understand that I am thinking about something or the other most of the time.” Now, reflective thought is like this random coursing of things through the mind in that it consists of a succession of things thought of; but it is unlike, in that, the mere chance occurrence of any chance “something or other” in an irregular sequence does not suffice. Reflection involves not simply a sequence of ideas, but a consequence – a consecutive ordering in such a way that each determines the next as its proper outcome, while each in turn leans back upon its predecessor. The successive portions of the reflective thought grow out of one another and support one another; they do not come and go in a medley. Each phase is a step from something to something, technically speaking, it is a term of thought. Each term leaves a deposit which is utilised in the next term. The stream or flow becomes a train, chain or thread.

61. What does thinking signify in its loosest sense ?

- (1) A penny for your thoughts
- (2) Day dreaming and idle fancy
- (3) What goes through our minds
- (4) The loose flux of casual and disconnected material that floats through our minds in relaxed moments

62. Explain the phrase “building castles in the air.”

- (1) day-dreaming
- (2) pretending to be wealthy
- (3) forming visionary projects
- (4) being disconnected

63. In what way is reflective thinking like loose thinking ?
- (1) It consists of a succession of things thought of
 - (2) It is a random coursing of things through the mind
 - (3) It is a group of good ideas
 - (4) None of the above
64. The word "coursing" may be substituted by
- (1) succession
 - (2) passing
 - (3) chasing
 - (4) running
65. How does reflective thinking differ from loose thinking ?
- (1) It is a sequence of ideas
 - (2) It is a consecutive ordering of ideas in such a way that one idea grows out of another, one supports the other
 - (3) It does not consist of a medley of ideas
 - (4) It is a group of related ideas

Directions for Questions 66 – 70 : Each of these questions consists of a word in capital letters followed by four alternatives. Select the alternative that is most **similar** in meaning to the word in capital letters in each case.

66. ARROGANT
- | | |
|---------------|-----------------|
| (1) diffident | (2) quarrelsome |
| (3) haughty | (4) selfish |
67. REPRISAL
- | | |
|-----------------|------------|
| (1) rebuke | (2) attack |
| (3) retaliation | (4) change |
68. INFRINGE
- | | |
|--------------|--------------|
| (1) enclose | (2) bar |
| (3) irritate | (4) encroach |
69. REPROOF
- | | |
|--------------|-------------|
| (1) rebuke | (2) warning |
| (3) ridicule | (4) threat |
70. STRINGENT
- | | |
|--------------|--------------|
| (1) dry | (2) rigorous |
| (3) strained | (4) shrill |

Directions for Questions 71 to 75 : Each of these questions consists of a word in capital letters, followed by four alternatives. Select the alternative that is **opposite** in meaning to the word in capital letters in each case.

71. PLENITUDE

- | | |
|---------------|---------------|
| (1) plenty | (2) fullness |
| (3) emptiness | (4) planetary |

72. ENTHRONE

- | | |
|------------|--------------|
| (1) depose | (2) decorate |
| (3) crown | (4) appoint |

73. INCENSE

- | | |
|------------|-----------|
| (1) small | (2) aroma |
| (3) pacify | (4) angry |

74. SERVITUDE

- | | |
|---------------|-------------|
| (1) help | (2) napkin |
| (3) obeisance | (4) liberty |

75. AMBIGUOUS

- | | |
|-------------|------------|
| (1) fertile | (2) bitter |
| (3) clear | (4) narrow |

Directions for Questions 76 – 80 : Each of these statements consists of four underlined sections one of which is incorrect as per usage of Standard English. You have to identify the segment that is incorrect, in each case.

76. Children shall obey their parents and elders.
(1) (2) (3) (4)

77. Soon you learn to manage your own affairs the better.
(1) (2) (3) (4)

78. I am afraid, I am very extremely late for the appointment.
(1) (2) (3) (4)

79. He never seldom tells lies or misbehaves.
(1) (2) (3) (4)

80. I hope in convincing you that your complaints have no real cause.
(1) (2) (3) (4)

TEST V
GENERAL SCIENCE

81. Which of the following is a scalar quantity ?
(1) Electric current
(2) Electric field
(3) Acceleration
(4) Linear momentum
82. A moving body is covering a distance in proportion to the square of time along a straight line. The acceleration of the body is
(1) increasing
(2) decreasing
(3) zero
(4) constant
83. A particle projected horizontally from the top of a tower clears range equal to the height of the tower. The path described is a part of a
(1) circle
(2) ellipse
(3) hyperbola
(4) parabola
84. A particle of mass m has momentum ' p '. Its kinetic energy will be
(1) mp
(2) $\frac{2p^2}{m}$
(3) $\frac{p^2}{m}$
(4) $\frac{p^2}{2m}$
85. When a torque acting upon a system is zero, which of the following will be constant ?
(1) Force
(2) Linear momentum
(3) Angular momentum
(4) Linear impulse
86. Oxygen boils at -183°C . This is approximately
(1) -297°F
(2) -329°F
(3) -261°F
(4) -215°F

- 87.** The velocity of sound in any gas depends upon
- (1) wavelength of sound only
 - (2) density and elasticity of gas
 - (3) intensity of sound waves only
 - (4) amplitude and frequency of sound
- 88.** To move a unit positive charge from one point to another point on an equipotential surface
- (1) work is done on the charge
 - (2) no work is done
 - (3) work done is a constant
 - (4) work is done by the charge
- 89.** A metallic wire of resistance $40\ \Omega$ is stretched to twice its length. Its new resistance would be approximately
- (1) $20\ \Omega$
 - (2) $80\ \Omega$
 - (3) $120\ \Omega$
 - (4) $160\ \Omega$
- 90.** The magnetic field lines
- (1) intersect at the neutral point
 - (2) intersect near north and south poles
 - (3) cannot intersect at all
 - (4) depend upon the position of the magnet
- 91.** The shape of methane molecule is
- (1) tetrahedral
 - (2) square planar
 - (3) trigonal
 - (4) linear
- 92.** Which of the following would have the lowest pH value ?
- (1) Human blood
 - (2) Milk
 - (3) Lime water
 - (4) Vinegar
- 93.** Haematite is an ore of
- (1) iron
 - (2) aluminium
 - (3) copper
 - (4) gold
- 94.** Electrical fires are best extinguished using
- (1) water
 - (2) sand
 - (3) salt solution
 - (4) saw dust

95. Alkali metals belong to
- (1) s-block
 - (2) p-block
 - (3) d-block
 - (4) f-block
96. A double bond between 2 carbons consists of
- (1) 2 sigma bonds
 - (2) 2 pi bonds
 - (3) one sigma and one pi bond
 - (4) one sigma bond only
97. Reaction $\text{Sn}^{2+} \rightarrow \text{Sn}^{4+} + 2\text{e}^-$ is an example of
- (1) Oxidation
 - (2) Reduction
 - (3) Complexation
 - (4) Polymerization
98. The following gas forms a protective shield for UV radiation in the atmosphere :
- (1) Nitrogen
 - (2) Hydrogen
 - (3) Ozone
 - (4) Helium
99. Soaps are sodium salts of
- (1) higher fatty acids
 - (2) mineral acids
 - (3) phenol
 - (4) glycerol
100. Rust on iron is due to
- (1) iron oxides
 - (2) iron sulphate
 - (3) iron chloride
 - (4) iron phosphate

SPACE FOR ROUGH WORK