

SERIES 11

Test Booklet Serial No.

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Total Number of Pages: 62 + 2 (for Rough Work)

Number of Questions: 175

Time Allowed: 2 Hours

Maximum Marks: 700

PLEASE FILL IN THE FOLLOWING INFORMATION:

Name of the candidate _____

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1. OPENING & CHECKING OF THE QUESTION PAPER BOOKLET AND ORS (OMR RESPONSE SHEET)

Break open the seal of the Test Booklet only when the announcement is made by the Invigilator. The ORS is placed inside the Booklet. After breaking the seal and before attempting the questions, you should immediately check for:

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3. One mark will be deducted for each incorrect answer. Correct answer carries four marks. Not answered questions carry zero marks.



SECTION 1 (49 Questions)

Questions 1-4 are based on the following:

ISRO's Moon Impact Probe (MIP) has the capability of taking 200 images in five minutes at moon and can transmit 200 images to earth in 10 minutes. It takes a pause for five minutes after every 10 minutes of work for cooling and recharging. Three companies, Agfa, Kodak and Cannon, have offered their fine computer processing and printing facilities to ISRO as per the following hourly processing and printing rates:

	Agfa	Kodak	Cannon
Each print up to 200 prints	Rs. 1.70	Rs. 1.75	Rs. 1.65
Each additional print after 200 prints up to 400 prints	Re. 0.55	Re. 0.60	Re. 0.70
Each additional print after 400 prints	Re. 0.50	Re. 0.45	Re. 0.40

- How many images will MIP transmit to earth in one hour if capturing the images and transmitting these are not done simultaneously?
 - 400
 - 500
 - 600
 - 700
- Which company's printing offer is the cheapest if the ISRO chooses to pay per hour?
 - Agfa
 - Kodak
 - Cannon
 - Both Agfa and Kodak
- If the ISRO uses Cannon in place of Agfa, how much has the ISRO to pay per hour?
 - 4% less
 - 4% more

- (3) 2% less
- (4) 2% more
4. If the ISRO uses Kodak facility for 360 prints per hour and also uses Cannon facility for 320 prints per hour, what percentage more or less per Image does ISRO pay to Kodak than to Cannon approximately?
- (1) 8%
- (2) 7%
- (3) 6%
- (4) 5%
5. In view of the present global financial crisis, the Finance Minister decided to slash the excise duties to boost demand and propel economic growth. The excise duty on cement was reduced by 30% of its present amount to boost the spending in the infrastructure. What should be the percentage increase in the consumption of cement so that the revenue of the government remains unchanged?
- (1) $42\frac{5}{7}\%$
- (2) $42\frac{6}{7}\%$
- (3) $34\frac{6}{7}\%$
- (4) $34\frac{5}{7}\%$
6. John, Mona and Gordon, three US based business partners, jointly invested in a business project to supply nuclear fuel to India. As per their share in the investment, Gordon will receive $\frac{2}{3}$ of the profits whereas John and Mona divide the remainder equally. It is estimated that the income of John will increase by \$60 million when the rate of profit rises from 4% to 7%. What is the capital of Mona?
- (1) \$2000 million
- (2) \$3000 million
- (3) \$5000 million
- (4) \$8000 million
-

7. Recently smoking at public places is declared as an offence. Delhi Police has started imposing a penalty against smoking in public and has eight raid teams in place. In a surprise check, the raid team caught 40 people smoking in the Connaught Place area of Delhi. The standard deviation and sum of squares of the amount found in their pockets were Rs. 10 and Rs. 40000, respectively. If the total fine imposed on these offenders is equal to the total amount found in their pockets and the fine imposed is uniform, what is the amount that each offender will have to pay as fine?
- (1) Rs. 90
 - (2) Rs. 60
 - (3) Rs. 30
 - (4) Rs. 15
8. The Vice-Chancellor of University of Delhi decided to form a committee to look into the feasibility of introduction of semester systems at the under-graduate level in the University. 5 members from the Executive Council and 7 members of the Academic Council were found suitable for the job. In how many ways can the Vice-Chancellor form a committee of 6 members such that at least 4 members of the committee belong to the Academic Council?
- (1) 462
 - (2) 422
 - (3) 412
 - (4) 442
9. A flight of Jet Airways from Delhi to Mumbai has an average speed of 700 kilometres per hour without any stoppage, whereas a flight of Kingfisher from Delhi to Mumbai has an average speed of 560 kilometres per hour with stoppage at Baroda. What is the average stoppage time per hour of Kingfisher flight if both the planes fly at the same speed?
- (1) 8 minutes
 - (2) 12 minutes
 - (3) 16 minutes
 - (4) 24 minutes
10. A 500-gram stone was dropped from the roof of a building. What is the height of the building if the stone reached the ground in 4 seconds?
- (1) 108.4 metres
-

- (2) 98.4 metres
- (3) 88.4 metres
- (4) 78.4 metres

11. A final year MBA student gets 50% in the exam and 80% in the assignments. If the exam should count for 70% of the final result and the assignment for 30%, what will be the final score of the student, if professors decide to use weighted harmonic mean to uneven performances?

- (1) 56.34%
- (2) 60.53%
- (3) 64.83%
- (4) 66.59%

12. While investigating the case of recent blasts in Delhi, the Delhi Police submitted two evidences E_1 and E_2 suggesting the involvement of a suspect in the crime to a local court. The court wants to decide whether the suspect is guilty (G) on the basis of pieces of evidence E_1 and E_2 . Suppose for both the evidences E_1 and E_2 the court determines the probability of guilt $P(G|E_1)$ and $P(G|E_2)$ to be 0.60 and 0.70, respectively. What is the probability of guilt on the basis of both the evidences E_1 and E_2 , i.e., $P(G|E_1, E_2)$?

- (1) 0.42
- (2) 0.60
- (3) 0.65
- (4) 0.78

Questions 13-14 are based on the following:

Under the scheme Jeevan Suraksha for the people below poverty line (BPL), the Central Government pays Rs. 6,000 to a private hospital for each caesarean birth belonging to BPL category delivered in the hospital. Normally, the caesarean births are only 10% of the total births in a year. It was observed that the scheme was misused by many private hospitals, pushing the figure of caesarean births up to 45% in the BPL category in a year. The Government wants to impose a penalty if the caesarean births are more than 10% in a hospital and deduct it from the amount paid for per caesarean birth to the hospital. The Government also decides to pay the equal total amount to the hospital in both the situations:

- (i) average 10% caesarean births, and
 - (ii) more than 10% caesarean births.
-

13. What amount should the Government pay for each caesarean birth if a hospital has done 30% caesarean cases in a year?
- (1) 1500
 - (2) 2000
 - (3) 2500
 - (4) 3000
14. What is the total amount to be paid for caesarean births to the hospital by the Government if there are 320 caesarean births out of total 800 births in the BPL category in a year?
- (1) Rs. 4,80,000
 - (2) Rs. 4,78,000
 - (3) Rs. 4,70,000
 - (4) None of these
15. Due to the recent global financial crisis, many companies in the field of IT Services offer jobs on contractual basis with a clause of fine for the leave taken by the employee. An ITS company employs an engineer for 290 days on a salary of Rs. 500 for eight hours work per day, and the engineer has to pay a fine of Rs.50 for each hour of his absence. The engineer may compensate his one-day absence by working 4 hours extra for two days. If the engineer receives Rs. 1,32,400 at the end of the contract, how many hours was he absent from his job?
- (1) 110 hours
 - (2) 112 hours
 - (3) 114 hours
 - (4) 118 hours
16. A space research company wants to sell its two products A and B. If the product A is sold at 20% loss and the product B at 30% gain, the company will not lose anything. If the product A is sold at 15% loss and the product B at 15% gain, the company will lose Rs. 6 million in the deal. What is the cost of product B?
- (1) Rs.140 million
 - (2) Rs.120 million
 - (3) Rs.100 million
 - (4) Rs.80 million
-

index, education index and GDP/SDP index. The education index is the combined index of two indices:

- (i) adult literacy rate with 2/3 weights and
- (ii) combined gross enrolment rate with 1/3 weight.

Consider the following data on India and China:

	India	China
Life expectancy index	57.2	80.0
Education index		
Adult Literacy Rate	48.7	86.7
Combined gross enrolment	59.1	100.0
GDP/State Domestic product index	19.0	30.5

20. What are the education index for China and the Human Development Index (HDI) for India?

- (1) Education index for China 94.13 and HDI for India 42.19
- (2) Education index for China 94.63 and HDI for India 42.39
- (3) Education index for China 91.13 and HDI for India 42.79
- (4) Education index for China 91.63 and HDI for India 42.49

21. ICICI bank offers a 1-year loan to a company at interest rate of 20 percent payable at maturity, while Citibank offers on a discount basis at a 19% interest rate for the same period. How much should the ICICI Bank decrease/increase the interest rate to match up the effective interest rate of Citibank?

- (1) increase by 3.5%
- (2) decrease by 1.8%
- (3) increase by 1%
- (4) increase by 1.4%

22. The present value of an optical instrument is Rs.20,000. If its value will depreciate 5% in the first year, 4% in the second year and 2% in the third year, what will be its value after three years?

- (1) Rs.16534.5
-

(2) Rs.16756.5

(3) Rs.17875.2

(4) Rs.17556.8

23. What is the area of the copper sheet required to prepare a cone of base radius 30 cm with the height 40 cm?

(1) 7543 cm²

(2) 5146 cm²

(3) 5432 cm²

(4) 7246 cm²

24. Let each side of a square is 20 cm. Four equal circles, each of radius 10 cm, are drawn about the four corners of the squares so that each touches two of the others. Find the area enclosed between the circumferences of the circles.

(1) 86 sq.cm

(2) 314 sq.cm

(3) 78 sq.cm

(4) None of these

25. In March 1, 2006 was Wednesday, which day was it on March 1, 2002?

(1) Wednesday

(2) Thursday

(3) Friday

(4) Saturday

26. A solid cube just gets completely immersed in water when a 0.2 kg mass is placed on it. If the mass is removed, the cube is 2 cm above the water level. What is the length of each side of the cube?

(1) 10 cm

(2) 8 cm

(3) 6 cm

(4) None of these

27. If $\log_7 \log_5(\sqrt{x+5} + \sqrt{x}) = 0$, what is the value of x ?

(1) 2

(2) 3

(3) 4

(4) 5

28. The matrix

$$A = \begin{bmatrix} 1 & -3 & 2 \\ -3 & 1 & 5 \\ 2 & -5 & 1 \end{bmatrix}$$

is:

(1) singular

(2) non-singular

(3) symmetric

(4) skew-symmetric

29. A manufacturer claims that only 2% items are defective in a shipment of 200 items sent by him. A random sample of two items is drawn from the shipment of 200 items. What is the probability that both the items drawn are defective?

(1) $\frac{3}{19900}$

(2) $\frac{6}{19900}$

(3) $\frac{9}{19900}$

(4) None of these

30. If the daily compounding rate of interest is 10% on an investment, what is the present value of Rs.50,000 that is to be received after two years?

(1) Rs.40936.54

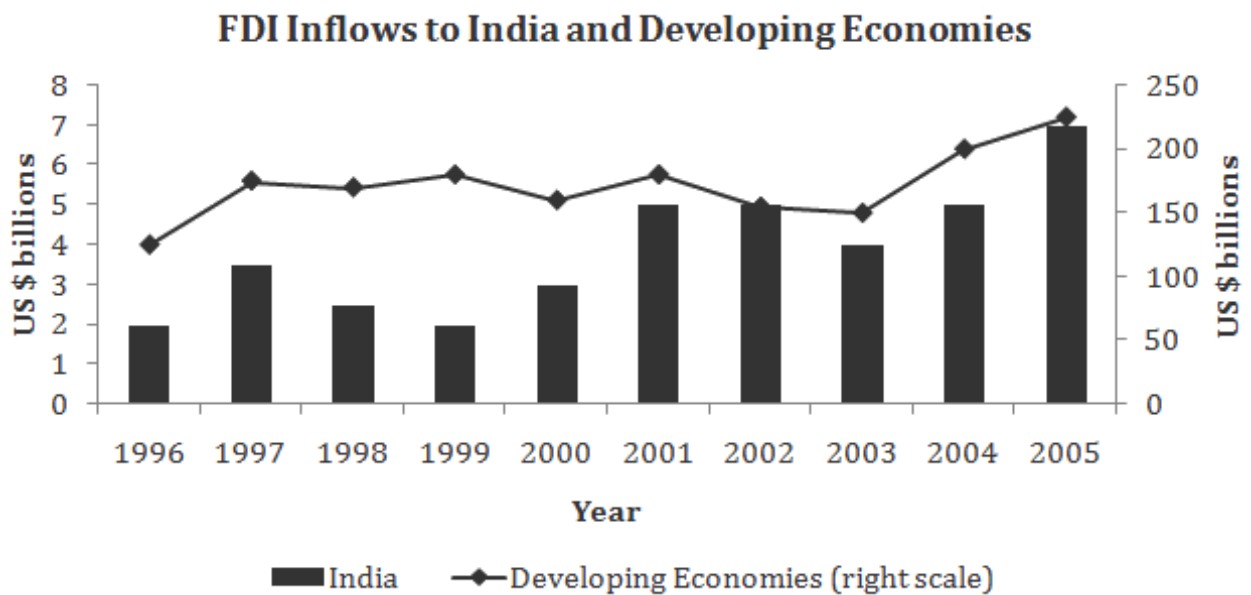
(2) Rs.41037.33

(3) Rs.41322.31

(4) Rs.40000

Question 31-34 are based on the following diagram:

Foreign Direct Investment (FDI) is an important source of non-debt inflows. It provides opportunities to host countries to enhance their economic development. The following chart represents the FDI inflows for India and Developing Economies during the years 1996 to 2005 in US dollars.



31. What was the average annual percentage growth rate in the FDI inflows for India during the year 2002 to 2005?
- (1) 12%
 - (2) 14%
 - (3) 17%
 - (4) 21%
32. What was the percentage rate of decline in the FDI inflows for developing economies during the years 2001 to 2003?
- (1) 14%
 - (2) 12%

(3) 11%

(4) 9%

33. In which of the following pair of years does the percentage change between the FDI inflows for developing economies was approximately equal to the percentage change in FDI inflows for India?

(1) 1997 to 1999

(2) 2000 to 2002

(3) 2001 to 2003

(4) 2003 to 2005

34. What is the ratio of the average FDI inflow for India to average FDI inflow for Developing economies during 2002-2005?

(1) 0.09

(2) 0.06

(3) 0.03

(4) None of these

35. If $\cot^2\theta - (1 + \sqrt{3})\cot\theta + \sqrt{3} = 0$ what is the value of θ ?

(1) $\frac{\pi}{2}, \frac{\pi}{3}$

(2) $\frac{\pi}{4}, \frac{\pi}{3}$

(3) $\frac{\pi}{4}, \frac{\pi}{2}$

(4) $\frac{\pi}{2}, \pi$

36. BSNL offers its share at a premium of Rs.40, whereas its par value is Rs.160. Parul Mehra invested Rs.50, 000 in this stock. After one year BSNL declared a dividend of 19%. What rate of interest did Ms. Mehra receive on her investment?

(1) 15.2%

(2) 16.2%

(3) 19%

(4) 19.2%

37. Delhi Metro Corporation engaged 25,000 workers to complete the project of IP state to Dwarka Metro Line in 4 years. At the end of the first year 10% workers were shifted to the other projects of Delhi Metro. At the end of second year again 5% workers were reduced. However, the number of workers increased by 10% at the end of the third year to complete the above project in time. What was the size of work force during the fourth year?

(1) 23145

(2) 23131

(3) 23512

(4) 23513

38. Let the cost of production P of Y units of computer chip be:

$$P = \begin{cases} 1000 + 5Y, & \text{when } 0 \leq Y \leq 500 \\ 2000 + 4Y, & \text{when } 500 \leq Y \leq 2000 \end{cases}$$

(1) P is discontinuous at Y = 500

(2) P is continuous at Y = 500

(3) P is uniformly continuous

(4) P is uniformly discontinuous

39. If the logarithm of a number is -3.153 , what are Characteristic and Mantissa?

(1) characteristic = -4 , mantissa = 0.847

(2) characteristic = -3 , mantissa = -0.153

(3) characteristic = 4 , mantissa = -0.847

(4) characteristic = 3 , mantissa = -0.153

40. The number $\sqrt{8} + 3\sqrt{7}$ is equal to:

(1) $\left[\frac{8 + \sqrt{7}}{\sqrt{2}} \right]$

(2) $8 - 3\sqrt{7}$

(3) $2\sqrt{3} + 3\sqrt{7}$

(4) $\left[\frac{8 - \sqrt{7}}{\sqrt{2}} \right]$

41. If a, b, c are in G.P. and $a^x = b^y = c^z$, then:

(1) $\frac{1}{x} + \frac{1}{z} = \frac{2}{y}$

(2) $\frac{1}{x} + \frac{1}{z} = -\frac{2}{y}$

(3) $\frac{1}{x} + \frac{1}{y} = \frac{2}{z}$

(4) $\frac{1}{x} + \frac{1}{y} = -\frac{2}{z}$

42. If

$$\sqrt{\frac{x}{1-x}} + \sqrt{\frac{1-x}{x}} = 2\frac{1}{6},$$

then the value of x is:

(1) $\frac{6}{13}$ or $\frac{4}{13}$

(2) $\frac{3}{2}$ or $\frac{2}{3}$

(3) $\frac{5}{2}$ or $\frac{2}{3}$

(4) $\frac{9}{13}$ or $\frac{4}{13}$

43. Given that θ is an angle between 180° and 270° , what is the value of θ if it satisfies the equation $3\cos^2 \theta - \sin^2 \theta = 1$?

a. 180°

b. 220°

c. 225°

d. 240°

44. What is the length of the tangent drawn from the point $(2, -1)$ to the circle $3x^2 + 3y^2 + 4x + 2y + 6 = 0$?

(1) 3

- (2) 6
- (3) 9
- (4) none of these

45. What is the locus of the point of intersection of two tangents to the parabola $y^2 = 4ax$, which are at right angles to each other?

- (1) $x - a = 0$
- (2) $x + a = 0$
- (3) $x - a = 4$
- (4) none of these

46. $\lim_{x \rightarrow 0} \frac{e^x - e^{-x}}{x}$ is equal to:

- (1) 4
- (2) 3
- (3) 2
- (4) ∞

47. If a company has a revenue function $R = 100q - q^2$, and cost function

$$C = q^3 - \frac{57}{2}q^2, \text{ what is the maximum profit?}$$

- (1) 5000
- (2) 8000
- (3) 10000
- (4) 15000

48. The marginal propensity to import is measured as the ratio of the change in imports to the change in income. If a household earns one extra dollar of disposable income, and the marginal propensity to import is 0.4, then of that dollar, the household will spend 40 cents on imported goods. If the relation between a country's import (I) and the income (x) is given by:

$$I = 3000 + \frac{1}{6}x^2,$$

what is the marginal propensity to import?

- (1) $3000x + \frac{x^3}{18}$
 - (2) $\frac{x^3}{18}$
-

(3) $\frac{x}{3}$

(4) $3000 + \frac{x^3}{12}$

49. If the heights of two cones are in the ratio 7:3 and their diameters are in the ratio 6:7, what is the ratio of their volumes?

- a. 6:14
- b. 12:7
- c. 3:7
- d. 5:7



SECTION 2 (49 Questions)

Information for questions 50 to 53:

Central Delhi University has a special budget of one crore and five lakh rupees that it wants to that it wants to distribute among its departments for innovative projects. Seven proposals have been received by the University, out of which some would be selected based on the funding requested and money available from the budget. An expert committee has evaluated all the projects and have given them scores on a scale of 1 to 5 (higher score implies better). A proposal can either be selected for full funding or dropped. The fund requests and expert committee scores for the seven projects are as follows:

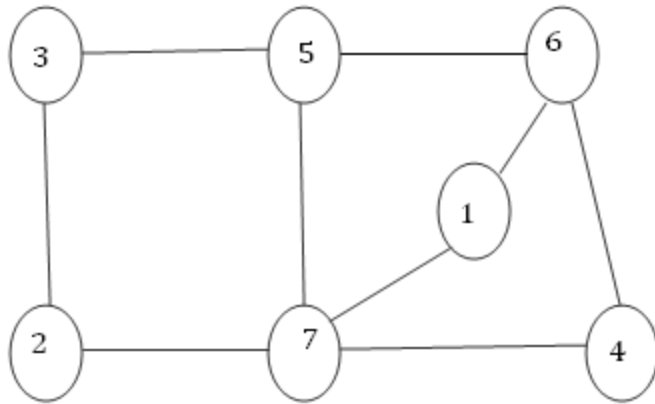
	Proposals	Fund requested	Score
(M)	Equipments for Astrophysics Lab	35 lakhs	1
(N)	Biotech Center	75 lakhs	3
(O)	Indian Language Research Center	25 lakhs	2
(P)	Disaster Management Center	57 lakhs	4
(Q)	New Course on Human 'Rights	27 lakhs	3
(R)	Research on Global Financial Crisis	22 lakhs	5
(S)	New Course on Design	65 lakhs	3

50. If the University has already decided to fund the Disaster Management Center, which are the other two projects that can also be selected?
- O and Q
 - O and S
 - M and R
 - O and R
51. If the University decides to select projects with total score between 7 and 9, which of the following combinations would require minimum total funding?
- Q and R
 - O and R
 - M and R
 - O and Q
-

52. If three projects are to be selected, which of the following combinations gives the maximum total score?
- a. P, Q and R
 - b. O, Q and R
 - c. O, P and R
 - d. Q, R and S
53. Ajay and Vijay work in the same office. Ajay sends a leave application for the day through Vijay. As per company policy, Ajay would receive a call from office if Vijay does not submit the leave application. Which of the following is true?
- a. Ajay receives a call from office, because the leave application was submitted
 - b. If Ajay does not receive a call from office, the leave application was not submitted
 - c. Ajay receives a call from office, only if Vijay doesn't submit the leave application
 - d. None of the above
54. A scientist is supposed to have a complete and thorough knowledge, at first hand, of some subjects and, therefore, is usually expected not to write on any topic of which he is not a master. This is regarded as a matter of noblesse oblige. For the present purpose, of writing this book, I beg to renounce the noblesse, if any, and to be freed of the ensuing obligation.
- Which of the following must definitely be true based on the above paragraph:
- (1) The author is about to write on a topic he is ignorant
 - (2) The author is a scientist
 - (3) The author has written at least one book prior to this
 - (4) None of the above

Information for questions 55 and 56:

In the following figure that represents a network of roads, more than one road meets at intersections identified by numbers written on them. The traffic department is considering installation of surveillance cameras at these intersections that are capable of identifying all traffic violations on all the roads converging there. The cost of installing a surveillance camera at an intersection is equal to the intersection number (in lakh of rupees). The Traffic Department wants all roads to be monitored at the minimum cost.



55. **Statement 1:** It is more cost effective to have surveillance-cameras on intersections '2 and 4' than on intersections '7 and 3'.

Statement 2: Intersection 5 must have a surveillance camera.

Which of the following is true?

- (1) Statement 1 is true but statement 2 is false
- (2) Statement 1 is false but statement 2 is true
- (3) Statement 1 is true and so is statement 2
- (4) Statement 1 and 2 are false

56. Which nodes should be selected for installation of surveillance cameras?

- a. 3, 6 and 7
- b. 3, 1 and 4
- c. 2, 5 and 4
- d. None of these

57. There are four teams in the Indian Professional Volleyball league: Karnataka, Punjab, Jharkhand, and Gujarat. Karnataka has 19 points and would be playing 1, 2 and 1 matches against Punjab, Jharkhand and Gujarat respectively. Punjab has 29 points and would be playing 2 and 1 matches against Jharkhand and Gujarat respectively. Jharkhand has 32 points and has 2 matches left against Gujarat. Gujarat is currently trailing the points table with 18 points.

A win in a match fetches 2 points and loses 0 point. In the final points table the team(s) which score(s) the lowest point is eliminated from the league.

Based on the data above which team would surely be eliminated?

- (1) Karnataka
-

- (2) Gujarat
- (3) Punjab
- (4) None of these

Information for questions 58 to 60:

Ajay would do five tasks: A, B, C, D and E; starting at 9 am in the morning. A is the first task and takes two hours. B can be done after A is complete and requires 1 hour. Work on C which would take 1 hour can start only after A and B are complete. Ajay can do task D along with B and C and would take 3 hours for that. Activity E with duration of 1 hour can start on completion of A, B, C and D.

58. What is the earliest time when Ajay would complete C?

- (1) 11 am
- (2) 12 noon
- (3) 1 pm
- (4) 2 pm

59. If Ajay takes 2 hours for B and completes other preceding tasks without delay, when can E start?

- a. 12 noon
- b. 3 pm
- c. 2 pm
- d. 1 pm

60. What is the earliest time when Ajay can complete all tasks?

- (1) 4 pm
 - (2) 3 pm
 - (3) 2pm
 - (4) 1 pm
-

Information for questions 61 to 63:

A, B and D meet their relations C, E, F and G while visiting the trade fair. A is the brother of B and D is the father of A. F is the only son of C and E. E, who is the brother-in-law of G, is the father-in-law of B.

61. How many female members are there?

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

62. How is G related to A?

- (1) Uncle
- (2) Father-in-law
- (3) Mother-in-law
- (4) None of these

63. Who is the spouse of F?

- (1) B
- (2) E
- (3) C
- (4) G

Information for questions 64 to 65:

In a city there are three bus routes 1, 2 and 3 between A and F. Route -1 has intermediate stops at B and D. Route -2 has stops at C and D. The shortest route-3 with a length of 10 km, stops at C only, which is exactly at the middle of this route. The longest route has 3 km more length than the shortest one. The distances between C and D, B and D and F and D are 4, 3 and 2 kilometers respectively.

64. What is the distance between A and B?

- (1) 5 km
 - (2) 6 km
 - (3) 7 km
 - (4) 8 km
-

65. What is the length of route-2?

- (1) 11 km
- (2) 12 km
- (3) 13 km
- (4) Insufficient information

66. Many colleges in Delhi are planning to prohibit use of mobile phones by students inside the college. But there are colleges which allow mobile phones inside the premises. Some colleges are even using a new technology that can use phones to make classroom teaching more interactive.

The paragraph best supports the statement that:

- (1) Classroom teaching is boring
- (2) Mobile phones can make classroom teaching more interactive
- (3) Mobile phones have become more affordable
- (4) There are two views on allowing use of mobile phones by students in colleges

67. 'Is world staring at Industrial recession?' This is the most hotly debated topic today. Financial markets are experiencing crisis situation worldwide. Stock-markets even in the middle-eastern countries are showing a downward trend. In another disappointing development, the US presidential elections have failed to remove uncertainties affecting the world economy. But countries like China have insulated themselves till recently due to their state-controlled banking systems.

The paragraph best supports the statement that:

- (1) State-controlled banking system is good for world economy
- (2) State-controlled banking system is good for China's economy
- (3) Positive developments were expected from US presidential elections
- (4) The results from US presidential elections have major impact on world economy

68. Complete the sequence of numbers below:

1, 11, 21, 1211, 111221,

- (1) 312211
 - (2) 311211
 - (3) 11133212
 - (4) 1223123
-

Information for questions 69 to 71:

A computer program converts a two-digit number into another number in five steps. The following example illustrates the operations on six two-digit numbers.

Input:	20	25	31	11	07	72
Step-1:	02	07	04	02	07	09
Step-2:	24	74	47	15	56	153
Step-3:	44	99	78	26	63	225
Step-4:	07	17	14	07	08	08
Step-5:	09	24	18	09	15	17

69. If the output in step-2 of a given input is 02, what would be the final output of that input?

- (1) 3
- (2) 7
- (3) 13
- (4) 0

70. If the input number is 17, what is the output of step-5?

- (1) 189
- (2) 271
- (3) 24
- (4) 39

71. What is the input for the output 8 in step-5?

- (1) 0
 - (2) 1
 - (3) 2
 - (4) 3
-

Information for questions 72 and 73:

Three men and three women are travelling in two cars (red and blue). Each car has exactly three persons. The cars cannot have all women or all men passengers. Mala, Ajit and Suman know how to drive a car. Mala and Sapna are women. Manjit and Sarat are not in the same car. Ajit and Sarat are men.

72. If the red car can have either Manjit or Sarat but not both while Ajit drives it and Mala is driving the blue car, which of the following can be true?
- (1) Suman is a man
 - (2) Manjit is a woman
 - (3) Both (1) and (2) are correct
 - (4) (1) is correct but (2) is not
73. If Suman and Manjit are the two passengers in the red car, who can be passengers of the blue car?
- (1) Sapna and Sarat
 - (2) Mala and Ajit
 - (3) Sapna and Ajit
 - (4) Mala and Sarat

Information for questions 74 and 75:

Rage killings are on the rise in the city. Police stations have registered 16% more cases as compared to the corresponding period last year. In most of these cases minor altercations have led to the crime. While cautioning the public, the Commissioner of Police in a press conference said that the number of rage killings in the city is fast approaching the figure for deaths due to road accidents which is on decline. A leading psychologist has attributed this to the growing complexity of city life and resulting intolerance due to exponential rise in population, large disparity between social strata and other modern-day socio-economic factors.

74. Which of the following, if true, would make the psychologist's argument stronger?
- (1) Residents dislike influx of outsiders into the city.
 - (2) There is a large and widening difference in income levels.
 - (3) Increase in city population has put immense pressure on basic infrastructure like water, electricity and open space.
 - (4) The number of deaths due to road accidents is on decline.
-

75. Which of the following was never intended by the Police Commissioner?

- (1) The number of deaths due to range killing can cross the number of deaths through road accidents.
- (2) The road-safety measures taken by the police have shown positive results.
- (3) The exponential increase in city population is responsible for rise in rage killings.
- (4) Public should be more cautious during social interactions

Information for questions 76 and 77:

English should be the only language used in the Parliament. There is no reason for the country to spend money printing documents in several different languages, just to cater to people who cannot speak English. The government has better ways to spend taxpayer's money, almost all of whom are comfortable with English. Legislators who come to the capital should learn to speak English.

76. Which of the following, if true, would make the speaker's argument stronger?

- (1) There is currently a law that says the government must provide legislators with documents in their language of choice.
- (2) Legislators who do not speak English are more close to the common man.
- (3) India has the largest English speaking population in the world.
- (4) Individual states have different official languages.

77. Which of the following, if true, would make the speaker's argument weaker?

- (1) The government currently translates official documents into more than twenty languages.
- (2) English is the most difficult language in the world to learn.
- (3) Most legislators who do not know English learn English within two months of their election to the Parliament.
- (4) Making English the official language is a politically unpopular idea.

Information for questions 78 to 80:

Everyday Miss Yadav, Miss Sharma, Miss Toppo and Miss Hussain go to a park for morning walk. One day, they reach the gate of the park at the same time and immediately start walking on the only circular track adjacent to the gate. Miss Yadav, Miss Toppo and Miss Hussain go on a clockwise direction while Miss Sharma goes anti-clockwise. Miss Hussain who is asthmatic is the slowest among the four and soon others move away from her. Like every day she could walk only

one round taking almost the same time as others to complete their morning walk. After her walk Miss Hussain reads the following instruction written at the gate while others join her one after another. "Walkers are requested to use only the 500 m walking track. Plucking of flowers and leaves are strictly prohibited. The park will remain closed from 6 pm to 5 am."

While walking Miss Yadav overtakes Miss Hussain twice; once near the fountain and the other time at the signature rock. Miss Toppo and Miss Sharma cross her three times.

78. What is the total distance covered by Miss Sharma and Miss Toppo together?

- (1) 3500 m
- (2) 4000 m
- (3) 2500 m
- (4) 3000 m

79. How many times Miss Yadav and Miss Sharma cross each other on the track?

- (1) Twice
- (2) Three times
- (3) Four times
- (4) Five times

80. How many times Miss Toppo would overtake Miss Yadav?

- (1) Never
- (2) Once
- (3) Twice
- (4) Three times

81. In a particular code, the digits from 0 to 9 are each represented by a different letter of the alphabet, the letter always representing the same digit. In case the following sum holds true when it is expressed in digits, which of the following cannot be correct?

$$\begin{array}{r} B \ C \ D \ E \\ + \ A \ D \ E \\ \hline 1 \ D \ H \ G \end{array}$$

- (1) G must be even
 - (2) C + A must be greater than 9
-

- (3) D must be greater than 3
- (4) B must be smaller than I

Information for questions 82 and 83:

Giving computer education in primary schools is a waste of money. Some private schools fleece parents in the name of computer education. Government should better use its resources in appointing more teachers and creating facilities. Children in primary schools are too young to learn how to use computers effectively. They need to learn the basics like numbers, arithmetic, reading and writing.

82. Which of the following, if true, would strengthen the speaker's argument?

- (1) Cost of ownership of Computers is very high
- (2) A recent report suggests that computers can hamper holistic growth of children
- (3) Research on the effect of internet on children
- (4) Examples of high school students who use computers to visit adult web-sites

83. Which of the following, if true, would weaken the speaker's argument?

- (1) Computers can be used to enhance learning in arithmetic and language
- (2) A study on preference of general public towards computers in primary schools
- (3) Reports on computer illiteracy among teachers
- (4) Students in USA have designed a new microchip

84. In a game show, participants are asked to build two towers of different designs using plastic bricks. These plastic bricks are of two types: Red and Blue. Participants are given a fixed number of bricks for building these towers. The height of each tower is measured and 2 points are awarded for every 10 centimeters of first building and 1 point is awarded for every 10 centimeters of second building.

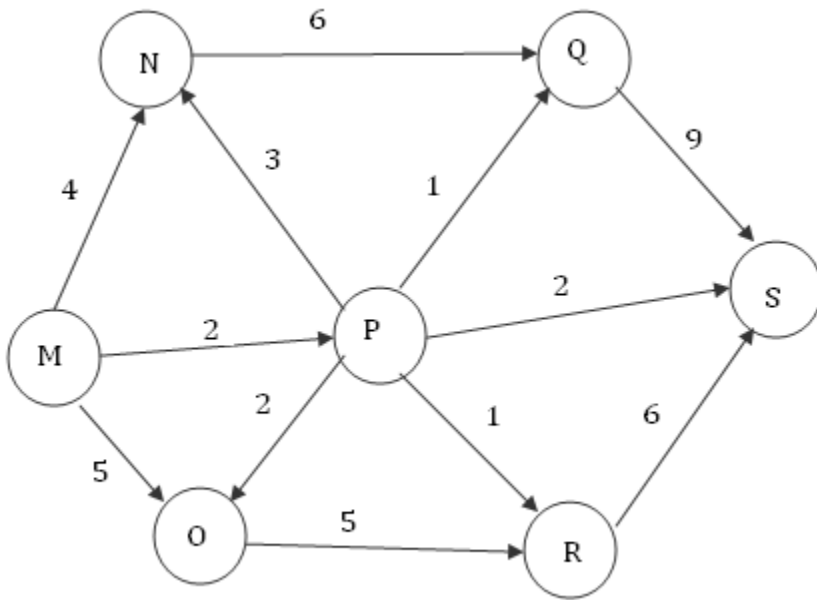
One participant has 4 red and 3 blue bricks left with him. If he wants to increase the height of his first tower, he would need 1 red and 2 blue bricks for every 10 cm. For the second tower, to raise the height he would need 2 red and 1 blue bricks, for every 10 cm. What is the best option for him now?

- (1) Raise the height of first tower by 20 cm
 - (2) Raise the height of second tower by 20 cm
 - (3) Raise the heights of first and second towers by 10 cm and 20 cm respectively
 - (4) None of the above
-

Information for questions 85 to 87:

Natural gas once extracted from a source is purified for commercial use at natural gas plants. From gas plants it is pumped to various destinations through pipelines. There are pumping stations, at intermediate places to maintain recommended pressure in the pipelines. The pumping stations do not produce or process any natural gas. They pump out exactly the quantity they receive from plants or other pumping stations.

The following figure depicts a network of natural gas pipelines. The circles denote the locations of gas plants, pumping stations or cities with big demand for natural gas. One location can be only one of these three. The numbers on the arrows are the capacities (in appropriate units) of the pipeline that carry gas in the direction of the arrow. Currently the demand supply situation is such that the capacity utilization of the pipelines is very close to 100%.



85. What is the maximum quantity of natural gas S can receive?

- (1) 13 units
- (2) 15 units
- (3) 16 units
- (4) 17 units

86. For which two cities it can be safely concluded that they have natural gas plants?

- (1) M and P
- (2) M and O
- (3) P and N

(4) M and N

87. What is the maximum quantity of natural gas that can be transported from M to R?

(1) 11 units

(2) 7 units

(3) 9 units

(4) 6 units

Information for questions 88 and 89:

On Sardar Patel Road there are three traffic lights P, Q and R. These traffic lights start working at 8.00 am in the morning. For traffic moving from P to R, through Q, during every two minute period the light turns green at P for 30 seconds. The same pattern is followed at R. At Q the traffic light turns red for 45-seconds in a periodic interval of 3 minutes. All traffic lights turn amber of 3 seconds after every green.

At 8 am the traffic lights turn green at P and R. Light at Q turns green, 20 seconds after light at P turns red for the first time in the day.

88. What will be the time lag between end of first red light after 9 am at Q and start of an immediate next green light at R?

(1) 1 minute and 3 seconds

(2) 1 minute and 7 seconds

(3) 1 minute and 12 seconds

(4) None of these

89. A motorist coming from P will find which light turned on at Q at 31 minutes past 9 am?

(1) Green

(2) Amber

(3) Red

(4) Insufficient information

Information for questions 90 to 92:

A television channel has scheduled five half-hour shows between 9.30 pm and midnight. Out of the three family drama shows 'Main Sati Hoon' has social message for audience. The family dramas bring in maximum revenues for the channel and they are scheduled one after another. The show 'Detective Doom' is a suspense thriller, a family drama and also has social message. Two of the family dramas have social message and one not having social message has adult content. There

are two shows which have adult content and they have been scheduled at 10.30 pm and 11.30 pm. The show 'HIV and India' is a news based program and also has social message. 'Midnight Murders' neither has social message nor is a family drama and is scheduled at 11.30 pm. The two news based programs but are not family dramas have been given two adjacent slots. The show 'Main Sati Hoon' has been scheduled for 10.00 to 10.30 pm slot and has a family drama preceding it. 'Laugh a While' is the fifth program.

90. When is 'Laugh a While' scheduled?

- (1) 9.00 pm to 9.30 pm
- (2) 9.30 pm to 10.00 pm
- (3) 10.00 pm to 10.30 pm
- (4) 10.30 pm to 11.00 pm

91. Based on the information above which of the following is not implied?

- (1) 'Midnight Murders' is a news based program
- (2) 'Laugh a While' has adult content
- (3) 'Detective Dooms' has adult content
- (4) 'HIV and India' has social message

92. When is 'HIV and India' scheduled?

- (1) 11.00 pm to 11.30 pm
- (2) 9.30 pm to 10.00 pm
- (3) 10.00 pm to 10.30 pm
- (4) 10.30 pm to 11.00 pm

Information for questions 93 and 94:

Find the statement that *must* be true according to the given information.

93. Every weekday, Ritu goes to her office in Gurgaon from Delhi. Last year around the time she joined this company, the new expressway between Delhi and Gurgaon was thrown open to public. Initially there was chaos. There were large queues at the toll collection booths. Her journey which used to take 45 minutes often took more than two hours. She stopped using public transport and started using her car to reach office, though it cost her four times her normal travel expense. These days the average vehicular speed on the express way is near 100 kmph and Ritu cruises to her office in 45 minutes.

- (1) The express way has reduced the travel time between Delhi and Gurgaon
- (2) Using public transport now would be more economical for Ritu
- (3) Traffic situation in Delhi-Gurgaon expressway is chaotic
- (4) There should be better management of queues at toll collection booths

94. The number of sports personalities endorsing commercial products in television advertisements is on the rise. Professional cricket players have been more successful in earning big money here. But media houses claim that they are more careful while signing cricketers. Film stars have always remained their favorite. Here the risk of drawing negative public sentiment due to bad performance in a series is not there.

- (1) Cricket players are better actors than film stars
- (2) Movie stars charge less than cricket players for endorsing commercial products
- (3) The popularity of cricket players come down when they don't perform well in a match
- (4) Media houses prefer movie stars to cricketers for endorsing commercial products

Information for questions 95 and 96:

In Patel Nagar police station, the requirements of constables who need to be on duty on weekdays are as follows: Monday - 2, Tuesday - 2, Wednesday - 2, Thursday - 2, Friday - 4, Saturday - 4 and Sunday - 3. There is a pool of constables who can be deployed. But the duty of a constable can start either on Friday or on Monday, who then works consecutively for five days. The police headquarters want minimum deployment of its manpower but at the same time it never compromises with requirements.

95. What is the minimum number of constables who should start duty on Monday?

- (1) 0
- (2) 1
- (3) 2
- (4) 3

96. Instead of Fridays and Mondays on which other two days should constables start their 5-day long duty so that the objective of the police department is satisfied?

- (1) Friday and Saturday
 - (2) Sunday and Monday
 - (3) Sunday and Tuesday
-

essentially have access to a single gene pool and hence to the adaptive mechanisms of the entire bacterial kingdom.

This global trading of genes, technically known as DNA recombination, must rank as one of the most astonishing discoveries of modern biology. 'If the genetic properties of the microcosm were applied to larger creatures, we would have a science-fiction world,' write Margulis and Sagan, 'in which green plants could share genes for photosynthesis with nearby mushrooms, or where people could- exude perfumes; or grow ivory by picking up genes from a rose or a walrus.'

The speed with which drug resistance spreads among bacterial communities is dramatic proof that the efficiency of their communications network is vastly superior to that of adaptation through mutations. Bacteria are able to adapt to environmental changes in a few years where larger organisms would need thousands of years of evolutionary adaptation. Thus microbiology teaches us the sobering lesson that technologies like genetic engineering and a global communications network, which we consider to be advanced achievements of our modern civilization, have been used by the planetary web of bacteria for billions of years to regulate life on Earth.

The constant trading of genes among bacteria results in an amazing variety of genetic structures besides their main strand of DNA. These include the formation of viruses, which are not full autopoietic systems but consist merely of a stretch of DNA or RNA in a protein coating. In fact, Canadian bacteriologist Sorin Sonea has argued that bacteria, strictly speaking, should not be classified into species, since all of their strains can potentially share hereditary traits and, typically, change up to fifteen percent of their genetic material on a daily basis. 'A bacterium is not a unicellular organism,' writes Sonea, 'it is an incomplete cell belonging to different chimeras according to circumstances. In other words, all bacteria are part of a single microcosmic web of life'.

99. If all human beings started behaving like bacteria, which of the following would be the most desired outcome by all humanity:

- (1) Creativity and innovation will increase
- (2) Greater unity in diversity
- (3) Population increase
- (4) We shall become identical to each other and be free of conflict

100. Which three processes are responsible for evolution:

- (1) Random mutation; Rapid division of genes in bacteria; Genes exchange in bacteria
 - (2) Random exchange of genes in bacteria; Speedy multiplication of bacteria; Creative mutation
 - (3) DNA self replication; Autopoieses; Gene pool theory
-

(4) Chance separation of double helix; Autopoiesis; Random selection

101. Regarding diseases caused by bacteria and virus and their eradication by medical science which conclusion is valid?

(1) Medical science generally remains ahead of bacteria and virus

(2) Bacteria and virus are generally ahead of medical science

(3) Bacteria and virus are not only ahead, but manage to undo something that medical science have achieved

(4) Bacteria and virus, and medical science are equal

102. Which statement is true regarding the work that bacteria do for the cause of humanity:

(1) Bacteria invented many essential biotechnologies that sustain life

(2) Bacteria challenge human beings to innovate

(3) Bacteria can give important lessons to human beings about sharing and communicating

(4) All the above work are important for the cause of humanity

103. Which philosophical paradigm does the model of creativity in evolution as described in the passage derives from:

(1) Holistic world view

(2) Descartes, Darwin, Newton

(3) Ecological framework

(4) Deep Ecology

104. What are the reasons given in the passage against the theory of “random mutation”, with respect to explaining evolution?

(1) Random mutation is a slow process

(2) Most of the times random mutation is harmful for the organism

(3) Random mutation is not possible in smaller organisms

(4) (1) and (2) are correct

105. Which principle described in the passage can become the basis of science fiction:

(1) DNA recombination

- (2) DNA recombination among large organism
- (3) DNA recombination among very small organism
- (4) Autopoietic system

Passage 2 (Q. 106-112):

I urge a 16th amendment, because "manhood suffrage", or a man's government, is civil, religious, and social disorganization. The male element is a destructive force, stern, selfish, aggrandizing, loving war, violence, conquest, acquisition, breeding in the material and moral world alike, discord, disorder, disease, and death. See what a record of blood and cruelty the pages of history reveal! Through what slavery, slaughter and sacrifice, through what inquisitions and imprisonments pains and persecutions, black codes and gloomy creeds, the soul of humanity has struggled for centuries, while mercy has veiled her face and all hearts have been dead alike to love and hope!

The male element has held high carnival thus far; it has fairly run riot from the beginning, overpowering the feminine element everywhere, crushing out all the diviner qualities in human nature, until we know but little of true manhood and womanhood, of the latter comparatively nothing, for it has scarce been recognized as a power until within the last century. Society is but the reflection of man himself, untempered by woman's thought; the hard iron rule we feel alike in the church, the state and the home. No one need wonder at the disorganization, at the fragmentary condition of everything, when we remember that man, who represents but half a complete being, with but half an idea on every subject, has undertaken the absolute control of all sublunary matters.

People object to the demands of those whom they choose to call the strong-minded, because they say "the right of suffrage will make the women masculine". That is the difficulty in which we are involved today. Though disfranchised, we have few women in the best sense; we have simply so many reflections, varieties and dilutions of the masculine gender. The strong, natural characteristics of womanhood are repressed and ignored in dependence, for so long as man feeds woman she will try to please the giver and adapt herself to his condition. To keep a foothold in society, woman must be as near like man as possible, reflect his ideas, opinions, virtues, motives, prejudices and vices. She must respect his statutes, though they strip her of every inalienable right and conflict with that higher law written by the finger of God on her own soul.

She must look at everything from its dollar-and-cent point of view, or she is a mere romancer. She must accept things as they are and make the best of them. To mourn over the miseries of others, the poverty of the poor, their hardships in jails, prisons, asylums, the horrors of war, cruelty, and brutality in every form, all this would be mere sentimentalizing. To protest against the intrigue, bribery, and corruption of public life, to desire that her sons might follow some business that did not involve lying, cheating and, a hard, grinding selfishness would be arrant nonsense.

In this way man has been moulding woman to his ideas by direct and positive influences, while she, if not a negation, has used indirect means to control him, and in most cases developed the very characteristics both in him and herself that needed repression. And now man himself stands appalled at the results of his own excesses, and mourns in bitterness that falsehood, selfishness and violence are the law of life. The need of this hour is not territory, gold mines, railroads or specie payments but a new evangel of womanhood, to exalt purity, virtue, morality, true religion, to lift man up into the higher realms of thought and action.

We ask woman's enfranchisement, as the first step toward the recognition of that essential element in government that can only secure the health, strength and prosperity of the nation. Whatever is done to lift woman to her true position will help to usher in a new day of peace and perfection for the race.

In speaking of the masculine element, I do not wish to be understood to say that all men are hard, selfish and brutal, for many of the most beautiful spirits the world has known have been clothed with manhood; but I refer to those characteristics, though often marked in woman, that distinguish what is called the stronger sex. For example, the love of acquisition and conquest, the very pioneers of civilization, when expended on the earth, the sea, the elements, the riches and forces of nature, are powers of destruction when used to subjugate one man to another or to sacrifice nations to ambition.

Here that great conservator of woman's love, if permitted to assert itself, as it naturally would in freedom against oppression, violence and war, would hold all these destructive forces in check, for woman knows the cost of life better than man does, and not with her consent, would one drop of blood ever be shed, one life sacrificed in vain.

106. This is an extract of the speech given by Elizabeth Cady Stanton in 1868 at Women's suffrage convention in Washington D.C. What should be the title of the speech?

- (1) The Destructive Male
- (2) The Power of Womanhood
- (3) Woman Enfranchisement and a Better World
- (4) Resurrection of Women

107. Which cluster best represents the masculine values portrayed in the passage:

- (1) Individualism, Materialism, Aggrandizement, and Violence
 - (2) Egoism, Competition, Materialism, Greed
 - (3) Violence, Immorality, Competition, Anger
 - (4) All of the options
-

108. According to the passage why are women subjugated to men?

- (1) Women do not have voting rights
- (2) Women do not have economic power
- (3) Women are intrinsically weak
- (4) Both options (1) and (2) are correct

109. Which cluster portrays values of womanhood alluded to in the passage:

- (1) Love, Life, Compassion
- (2) Purity, Virtue, Morality
- (3) Sentiments, Divinity, Forgiveness
- (4) Both options (1) and (2) are correct

110. The author of the speech is:

- (1) A Feminist
- (2) A Man-hater
- (3) An Activist
- (4) A Mysogynist

111. According to the passage which statement is correct:

- (1) Men are destructive and selfish and women try to clone male qualities in order to survive
- (2) Men destroy and women preserve.
- (3) Subjugation of women has caused societies to become cruel, selfish and destructive
- (4) Women are like nature, who always try to balance

112. What is the key inference that we can make from the passage:

- (1) Female values which are life sustaining have got annihilated
- (2) Male values are not balanced by female values
- (3) Unchecked and untempered male values have caused destruction and misery in the world
- (4) All inferences are correct

Passage 3 (Q. 113-119):

The relationship between competition and innovation has been the subject of some debate. Some argue that in a competitive situation any enterprise can earn only normal profit and therefore no enterprise would have the resources for undertaking meaningful research and development. They believe that only an enterprise earning monopoly profit would be able to accumulate the resources needed for it. However, the counter-argument is that though a monopolist may have the resources for innovation, it does not have the motivation to do so in the absence of any competitive pressure. On the other hand, the prospect of monopoly profit is an incentive for innovation. Schumpeter argues that even if existing monopolists earn such profits in the short run, in due course outsiders would enter the market and erode the monopoly. In his view, therefore short-term monopoly power need not cause concern.

This brings us to the interface between competition law and IPR. A debate rages here as well. An IPR, such as a patent or a copyright, confers a monopoly on the IPR holder for a given period of time. Since a monopoly right is prone to abuse, tension arises between the IPR and competition law, one conferring a monopoly, the other wary of it. At the fundamental level, competition law does not challenge the IPR itself; it respects IPR as being necessary for rewarding innovation, for providing an incentive to others, particularly competitors, to innovate or to improve existing innovation and, equally importantly, to bring into the public arena innovations that might otherwise remain only in the private domain. Without the protection offered by IPR, others would be able to free ride on the innovation and the innovator would not be able to secure returns on his investment.

The concern that competition authorities have regarding IPR is not in the inherent right itself, but in the manner of the exercise of that right, whether restrictions are being introduced that go beyond the protection of the IPR and result in throttling competition. Usually these concerns arise in the licensing of the IPR by the holder thereof. Thus, the two legal systems at a fundamental level have commonality of goals, but at the operational level, particularly in the short run, the two systems can seem to be pulling in different directions and the interface becomes difficult to manage.

In this knowledge era, technological advances are exploding. The quantum of new knowledge and new technology added in the last few decades alone might perhaps be more than in the entire history of mankind. The role of technological advances in our lives and in business is now immense. This is, particularly true in areas like biotechnology, medicine, information technology and communications technology. Correspondingly, the number of patents, copyrights and other forms of IPR has also grown in geometrical progression. This makes the issue of managing the interface more difficult but equally more important and pressing than ever before. In competition law, it has emerged as one of the most important areas demanding attention from competition authorities, governments and regulators.

IPRs have certain special economic characteristics:

1. The fixed costs in producing intellectual property are typically high requiring substantial investment in research facilities and scientific talent.
-

2. The risk in these investments is also high as many research products may turn out to be unfruitful.
3. Though costly to produce, intellectual property can be easily copied or misappropriated and the marginal costs in doing so are very low.
4. Intellectual property often depends upon other intellectual property for its successful commercial exploitation.

These characteristics explain an IPR holder's special concerns for protecting his It by incorporating conditions and restraints that would ensure his property not copied. For example, some of the restrictions are cross-licensing agreements, tying, exclusive dealing and exclusive territories.

On the other hand, there are practices or constraints which are not directly required for protecting IPR and restrict competition in unjustifiable ways. Some of the objectionable practices are patent pooling, grant back, refusal to deal, payment of royalty after expiry of patent period, condition that the licensee will not challenge the validity of IPR and using tie-in by the IPR holder to gain access in other product markets.

In some merger cases where the merged parties are the only two having IPR over the same product, the competition authority's concern is that this could lead to market power in the hands of the merged parties in that product market. For example, in the merger of Ciba-Geigy with Sandoz, the two were among the very few entities capable of commercially developing a broad range of gene therapy products. The competition authority agreed not to block the merger only after the merging parties agreed to certain compulsory licensing conditions. Similarly with Glaxo and Wellcome: both had products in the US' Food and Drug Administration approval process for treating migraine with an oral dosage; the competition authority had difficulty in agreeing without conditions that would mitigate the merged parties' market power.

113. Which of the following statements is false regarding the relationship between competition and Intellectual Property Right (IPR)?

- (1) Cross-licensing agreements protect the IPR holder against free riders of innovation
- (2) Mergers and acquisitions increase the risk of creating monopolists in the area of an innovation
- (3) Monopolists have the money and motivation to engage in research and development
- (4) At the fundamental level competition law does not challenge IPR

114. Which set of risks are most relevant to developing intellectual property for a commercial organization?

- (1) cost, redundancy, imitation, cross dependence
-

