Directions (Questions 1-10): Study the passages below and answer the questions that follow each passage.

Passage I

Even after many years of high growth in India, there are those who see the signs of dynamism that are visible again in the economy with skepticism. Our growth puzzles them. One section regards it as a fluke, due to external sources and, therefore, unsustainable without wholesale opening up and reforms. The reforms advocated are about creating more opportunities for industry, whether internal or external. There are doubters also at the opposite end of the ideological spectrum. They are the ones who want redistribution, even if it kills growth that raises standards of living. Either way, the current resurgence despite adverse conditions suggests there are some robust growth drivers. The countries, largely in Asia, which sustained growth rates of above 7 per cent for more than 25 years, had policies that were pragmatic, not ideological. Their common characteristics included openness, macroeconomic stability, high savings and investment rates, and market-based allocation of resources. The governments here were pragmatic, flexible and capable. While willing to intervene in markets to promote exports through industrial policies, and to manage exchange rates (through use of selective capital controls and reserve accumulation), they were flexible enough not to get locked into distorting policies. They were willing to anticipate and change policies as was required for growth imperatives of the moment. Resource mobility and urbanization was supported. Public investment in infrastructure accounted for 5-7 per cent of GDP or more. All these were further enabled by specific contextual interventions and creation of microeconomic incentives. Creating more productive jobs and raising the level of real minimum wages is important for inclusion and social equity. But a precondition for all this would be raising agricultural productivity. To create jobs, should we rely on an undervalued currency and labour-intensive exports or on higher wages and vibrant domestic demand? The idea of a labour-intensive manufacturing sector seeks to basically ape China's development strategy. But it ignores India's own unique growth directions, education mix, and the international climate. As advanced countries compete to depreciate their own currencies, an undervalued rupee may not be feasible. An appreciating currency, on the contrary, can be a precondition for real wages to rise without inflation. It means that an export strategy that promotes diversification of destinations and aims to utilize and further develop the medium-range skills, in which we have developed a comparative advantage, is more likely to succeed. Diversity in destinations will counter slower growth in the West, while rising real domestic wages would boost the domestic market. Since demand for most imported intermediate goods is inelastic, a stronger currency will lower costs for domestic firms, including exporters. It will also help the current infrastructure building cycle, which, by reducing transaction costs and related hurdles, is the best way for India to compete even in the low-skill export segment. Moreover, since primary education was neglected, India does not have the legions of trained factory workers that China could provide. On the other hand, higher education has been more effective in India. Although the quality here is heterogeneous, in-house training and specialized schools have helped bring the required medium-range skills up to scratch. Better job availability has also led to improvement in universal primary enrolment. But current entrants will have to be given opportunities to acquire further skills. The industry structure in future should be such as to absorb them.

1. It is implied in the passage that

(1) India has been experiencing economic growth over the past several years, and is now set for a fresh spurt of growth.

(2) There are good signs of economic growth in the future for India, although the past has been not so bright.

(3) Raising agricultural productivity is the only way to ensure further economic growth in India.

(4) There are enough doubters of India's ability to progress but none to believe in the same.

2. The governments in Asian countries have, by and large,

A shown good foresight in framing economic policies.

B maintained steady economic growth rates.

C been willing to change their policies in keeping with the changing economic scenario.

(1) A & B (2) B only (3) A, B & C (4) C only

3. Which of the following statements is/are not true as per the passage?

(1) Efforts to increase income levels have to go hand-in-hand with efforts to increase agricultural productivity.

(2) Many Asian countries have been on the growth path in respect of their economies.

(3) India alone, amongst the Asian nations, is bound to experience growth in the future.

(4) India would do best by planning its economic growth based on its own strengths in the present context, rather than continue with the earlier reform methodology.

4. What, according to the passage, are the essential differences between the economies of China and India?

(1) China's focus has been on labour-intensive manufacturing sector as against India's focus on factors such as resource mobilization, urbanization, infrastructure development, and so on.

(2) China has been exporting its industrial output to countries all over the world; while India has been selectively exporting to western countries.

(3) China has established a stranglehold on the world's export markets; while India's economic policies have left India incapable of competing with China in this sector.

(4) China has 100% literacy at primary school level; while India has been focusing on ensuring growth in higher education levels.

5. Which of the following factors would help maintain healthy economic conditions in India?

A Emulating China's development strategy.

B Factory workers and higher-grade employees have to be given in-house training to ensure that their skill levels are up to contemporary standards.

C Agriculture must remain a primary focus area of governmental policy-making.

(1) B only (2) A & B (3) A, B & C (4) B & C

Passage II

The BASIC quartet-Brazil, South Africa, India and China-came together scotching all rumours that China had decided to break ranks when it made its "offer" of accepting a legally binding agreement. On Tuesday, ministers from the four countries stressed on the need to consider scientific review while considering a post 2020 regime for global action on climate change. They also underscored the need to keep environmental integrity, common but differentiated responsibility, and respective capability in mind while charting the way forward. The BASIC ministerial response came amid growing talk that the advanced developing countries were no longer of the same view on the issue of a new global treaty that would require them to take on legal obligations. The South Africa minister said, "we will engage with other groups, but within the context of the G77 and China. We will work towards a solid agreement that takes global action forward." The leader of the China delegation and the vice-chairman of the National Development and Reform Commission (NDRC) said, "together with other countries the BASIC will make due contribution to deal with climate change." While China reiterated the five pre-conditions, including a second commitment period under the Kyoto Protocol, to consider participation in a legally binding regime, India offered another reiteration of that position. "Some countries have projected the question of a legally-binding agreement in future as a panacea for climate change. This is completely off the mark. This question confuses implementation with ambition. There is an ambition gap because the Kyoto protocol parties have not fulfilled their political obligations. There are more in the wings that are preparing to announce their intention to forsake their international obligation. We need to ensure that the parties meet their commitments whether under the Convention or the Kyoto Protocol," the environment minister of India said. India has questioned the timing of the demand for a new global treaty. It has argued that developing countries should not be asked to "make a payment" every time "an existing obligation becomes due on the part of the developed countries." The minister has made it clear that India has an open mind on the issue, but perhaps it is not the right time to consider a new agreement. The Chinese representative endorsed the position articulated by India and reiterated that the Chinese position was not a new one. "On legally binding, I fully endorse the position articulated by the minister from India. The five pre-conditions that China has set out are not new points. These are there in the Bali Action Plan, Copenhagen Accord and the Cancun Agreements. It is time to honour these commitments." Brazil, which was represented by its Ambassador, said that the country was "willing to walk the extra mile to ensure a second commitment period."

6. It is evident from the passage that

(1) four large developing countries have formed a bloc called BASIC in order to work towards ensuring equitable responsibility on the part of both developed and developing countries in tackling climate change.

(2) there is no common minimum position in respect of tackling the environment amongst the four countries otherwise collectively known as BASIC.

(3) China is not ready to have any sort of agreement with India, Brazil and South Africa when it comes to the matter of regulating legislation for maintaining ecological balance.

(4) India has taken the lead and initiated the grouping known as BASIC, in order to protect the ozone layer.

7. Which of the following statements is not true in the context of the passage?
   (1) China has given clear indications of back-tracking on the issues of agreement between the BASIC countries.
   (2) The common minimum position mutually accepted by the BASIC countries is legally binding on them.
   (3) Cracks have begun to appear in the BASIC alliance; calling for urgent remedial measures to keep the grouping intact
   (4) All these

8. From the passage what appears to be the primary objective of 'BASIC'?
   (1) To build better ties amongst its constituents.
   (2) To set pre-conditions for any global agreements on climate change.
   (3) To share strategic environment-related information.
   (4) None of these

9. The passage appears to have been written against the backdrop of
   (1) recording the individual responses of the BASIC countries to a common communication to them from the developed and G-77 countries.
   (2) a meeting between the representatives of BASIC countries.
   (3) a meeting between developing and developed countries on the sidelines of the KYOTO summit.
   (4) None of these

10. It can be inferred from the passage that
   (1) the developed countries have made fresh proposals in respect of tackling climate change, without first fulfilling their earlier commitments.
   (2) there is broad consensus between India and China in the matter of tackling climate change.
   (3) the BASIC countries are willing to enter into dialogue with the developed countries in order to resolve contentious issues with regard to tackling global climate change.
   (4) All these

Directions (Questions 11-14): Choose the order of the sentences marked A, B, C, D and E to form a logical paragraph.

11. A The work of Indian-law scholars and practitioners seems isolated from the more general span of Public-law scholarship and practice.
   B Indeed, the mere mention of the field is a conversation stopper for public law generalists of either the academy or the practicing bar.
   C Federal Indian law is perhaps the least respected and most misunderstood area of public law.
   D Although the field produces a steady diet of cases for the Supreme Court, the Justices have little love for the topic.
   E There are probably many reasons why federal Indian-law is out of the mainstream.
   (1) ABCDE (2) CDABE (3) DCABE (4) EDCBA

12. A The Indian Constitution has recognized the significance of education for social transformation.
B It is a document committed to social justice.
C The preamble affirms a determination to ensure the dignity of the individual and the unity of the nation.
D Literacy forms the cornerstone for making the provision of equality of opportunity a reality.
E The objective specified in the preamble contains the basic structure of the Constitution, which cannot be amended.

(1) DEABC (2) ABEDC (3) BCEDA (4) ABCDE

13. A India, as an emerging economic superpower, enjoys a rich maritime heritage in trade and commerce and its associated law is firmly rooted in historical antiquity.
B But while modern Indian jurisprudence enjoys a high degree of repute and recognition in the maritime law field, India is yet to secure a position of superiority in the international arena.
C And the potential for development in this field is immense, and is realizable through sound university education.
D Trade is the life blood of a nation and shipping is the predominant mode through which international trade is carried out.
E Needless to say, public and private sector support and involvement are necessary to achieve the desired aims and objectives.

(1) DABCE (2) ECADB (3) ABECD (4) CDEAB

14. A India's patriarchal culture has made the process of gaining land-ownership rights and access to education challenging for them.
B In the past two decades, there has also emerged a disturbing trend of sex-selective abortion.
C To Indian feminists, these are seen as injustices worth struggling against.
D Despite the progress made by Indian feminist movements, women living in modern India still face many issues of discrimination.
E And many feminist leaders have picked up cudgels in support of this cause.

(1) BCDEA (2) ACDEB (3) DABCE (4) ABCED

Directions (Questions 15-18): Choose the word which best expresses the meaning of the underlined word.

15. His judicious handling of the matter saved the situation from going out of control.

(1) nervous (2) helpful (3) sensible (4) cautious

16. Deepak has a penchant for fine poetry.

(1) horror (2) bias (3) liking (4) training

17. His speech was full of affectation.
(1) boasting (2) pretence (3) pedantry (4) euphemism

18. I wrote to him as lately as last week.
(1) late (2) recently (3) early (4) immediately

Directions (Questions 19-22): Choose the word which is opposite in meaning of the underlined word.

19. She is indeed human.
(1) universal (2) devilish (3) terrestrial (4) divine

20. He is always hungry for wealth.
(1) ravenous (2) famished (3) satiated (4) greedy

21. How can you cut an apple with this blunt knife?
(1) pointed (2) sharp (3) polished (4) filed

22. It was really a gracious occasion for me.
(1) benign (2) farcical (3) churlish (4) wasteful

Directions (Questions 23-26): In each of these questions, a word has been written in four different ways out of which only one is correctly spelt. Choose the correctly spelt option.

23. (1) beligrent (2) beligerent (3) belligrent (4) belligerent

24. (1) dielect (2) diallect (3) dilect (4) dialect

25. (1) adultration (2) adeltration (3) adelteration (4) adulteration

26. (1) gorgette (2) georgette (3) gorgete (4) georget

Directions (Questions 27-30): Fill in the blanks.

27. She is tired _____ making appeals to her in-laws.
(1) with (2) from (3) of (4) about

28. Now a days Rajani is ____ busy to take care of her health.
(1) very (2) too (3) so (4) extremely

29. A man who connives _____ the faults of his children is their worst enemy.
(1) with (2) at (3) of (4) on

30. Help yourself _____ whatever you can use without wasting it.
(1) with (2) to (3) by (4) on

31. The Delhi - Mumbai Industrial corridor is a 1,483 km project running through seven states including which of the following?
(1) UP - Haryana - Rajasthan - Gujarat - MP
(2) UP - Uttarakhand - Rajasthan - Gujarat - MP
(3) UP - Uttarakhand - Punjab - Rajasthan - Gujarat
(4) UP - Haryana - Rajasthan - Punjab - Gujarat

32. Which country/territory, hitherto enjoying observer status, was granted full membership of UNESCO in October 2011?
(1) Myanmar (2) Tibet (3) Palestine (4) India

33. The coin of what denomination went out of circulation in India with effect from June 30, 2011?
(1) 50 paise (2) 25 paise (3) One rupee (4) 10 paise

34. Which country, given Most-Favoured Nation status by India in 1996, reciprocated the gesture in November 2011?
(1) Nepal (2) China (3) Canada (4) Pakistan

35. Name the noted Indian mathematician whose 125th birth anniversary was celebrated on December 22, 2011?
(1) Ramanujan (2) Bhaskara (3) Shakuntala Devi (4) None of these

36. Which are the countries considered to be the world's five major emerging economies; also collectively known as the 'BRICS' countries?
(1) Brazil, Russia, India, China and South Africa.
(2) Brazil, Russia, India, China and Singapore.
(3) Belgium, Romania, India, China and Sri Lanka.
(4) Brazil, Russia, Italy, Canada and South Africa.

37. In which of the following countries was the First Asian Yoga Championship organized by the Asian Yoga Federation headquartered in India, held recently?
(1) Thailand (2) India (3) Sri Lanka (4) Bhutan

38. Who was listed as the world's richest Indian, in October 2011, by the Forbes India annual rich list?
(1) Ratan Tata (2) Mukesh Ambani
(3) Vijay Mallya (4) None of these

39. The nationally revered song "Vande Mataram" was composed by
(1) Rabindranath Tagore (2) Bankim Chandra Chatterji
(3) Harivanshrai Bachchan (4) Sarojini Naidu

40. How many 'Fundamental Rights' does the constitution of India offer to all its citizens?
(1) 4 (2) 5 (3) 6 (4) 7

41. The Kaziranga National Park, internationally famous for the one-horned Rhino, is in
(1) Uttar Pradesh (2) West Bengal (3) Sikkim (4) Assam

42. Cyrus P Mistry's name was recently in the news for being chosen as the incumbent chairman of which of the following business conglomerates?
(1) Reliance group (2) Shapoorji Pallonji group
(3) Tata Sons (4) Birla group

43. Which state of India had its assembly elections in seven phases during February-March 2012, for a total of 403 seats?
(1) Uttar Pradesh (2) Uttarakhand (3) Manipur (4) Punjab

44. Which day is observed as World Day of the Handicapped every year, as promoted by the UN?
(1) December 3 (2) December 4 (3) December 5 (4) December 6

45. In which US city was the world parliament of religions held in 1893, the year in which Swami Vivekananda participated in the same?
(1) Chicago (2) Los Angeles
(3) Pittsburg (4) None of these

46. The world's highest 'Rail Bridge', being constructed in the state of Jammu and Kashmir will be across which of the following rivers?
(1) Ravi (2) Jhelum (3) Chenab (4) Indus

47. "Hertz" is a well known provider of which of the following travel-related services in India?
(1) Air ticketing (2) Jungle Safari rides
(3) Car rentals (4) Radio taxi

48. The government of Nepal has decided to develop a 7-km stretch, generally believed to be the route taken by _____ to reach Rajgir (Bihar), as a tourist site.
(1) Mahatma Gandhi (2) Gautama Buddha
(3) Emperor Ashoka (4) None of these

49. The Chinese Government has recently announced a one-million US dollar aid for the reconstruction of which of the following places of historic importance in India?
(1) Nalanda University, Bihar
(2) Sanchi Stupas, Madhya Pradesh
(3) Buddha Museum at Nagarjunasagar, Andhra Pradesh
(4) None of these

50. 'Rail Bandhu' is the

(1) name of the in-house magazine to be published and placed in upper class rail coaches by the Indian Railways.

(2) proposed name for the chain of hotels to be built by IRCON.

(3) proposed name for the personnel manning the enquiry counters set up in railway stations for the facilitation of passengers.

(4) None of these

51. A large tank filled with water to a height h is to be emptied through a small hole at the bottom. What is the ratio of the time taken for the level to fall from h to $\frac{h}{2}$ and that taken for the level to fall from $\frac{h}{2}$ to 0?

(1) $\sqrt{2}$ (2) $\frac{1}{\sqrt{2}}$ (3) $\sqrt{2}-1$ (4) $\frac{1}{\left(\sqrt{2}-1\right)}$

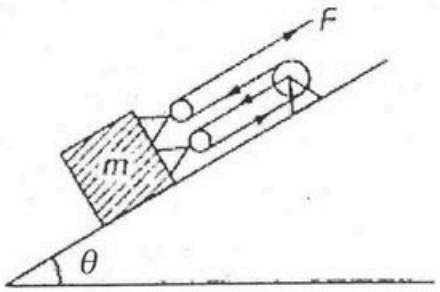
52. A body kept on a smooth inclined plane having inclination 1 in l will remain stationary relative to the inclined plane if the plane is given a horizontal accleration equal to

(1) $\frac{g}{\sqrt{l^2-1}}$ (2) $\frac{gl}{\sqrt{l^2-1}}$ (3) $\frac{g}{2\sqrt{l^2-1}}$ (4) $\frac{2g}{\sqrt{l^2-1}}$

53. A body B of mass m moving forward with velocity v along the x-axis, collides elastically with a stationary object C of mass 2m at the origin. After the collision, body B moves backward along the x-axis. Given that the kinetic energy of the system is conserved, what is the speed of the object C after the collision?

(1) $\frac{2v}{3}$ (2) $\frac{v}{2}$ (3) $\frac{v}{3}$ (4) $\frac{3v}{4}$

54. A force F pulls on a mass m using a massless cable and pulley system as shown in the figure given above. What is the acceleration of the block, if the surface is frictionless?



(1) $a=\left(\frac{F}{m}\right)-g\sin\theta$ (2) $a=2\left(\frac{F}{m}\right)-g\sin\theta$

(3) $a=3\left(\frac{F}{m}\right)-g\sin\theta$ (4) $a=4\left(\frac{F}{m}\right)-g\sin\theta$

55. A satellite is orbiting close to the surface of earth. In order to make it move to infinity, its velocity must be increased by about

(1) 50% (2) 40% (3) 30% (4) 20%

56. A projectile is thrown in the upward direction making an angle of 60° with the horizontal direction with a velocity of 147 ms^{-1}. Then the time after which its inclination with the horizontal is 45°, is

(1) 15 s (2) 10.98 s (3) 5.49 s (4) 2.745 s

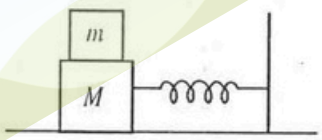
57. A particle is projected vertically upward with a velocity $\sqrt{gR}$ where R is radius of earth. What is the maximum height ascended by the particle?

(1) $\frac{R}{2}$ (2) R (3) 2R (4) $\frac{5R}{4}$

58. A small table is orbiting with a constant angular velocity on a circular track. A glass half full of water is fixed on the table. The surface of water in the glass is

(1) horizontal
(2) inclined with radially outer side being higher
(3) inclined with radially outer side being lower
(4) like a whirlpool with a dip in the centre

59. A block *m* of mass 1 kg is placed over a bigger block M of mass 10 kg as shown in the figure. The coefficient of static friction between the two blocks is 0.4 and the acceleration due to gravity is 10 m/s^2. The bigger block, connected to a spring of force constant 200 N/m can oscillate on a frictionless table as shown in the figure. What can be the maximum amplitude of simple harmonic motion, if no slippage is to occur between the blocks?



(1) 0.19 m (2) 0.22 m (3) 0.25 m (4) 0.30 m

60. The work done while stretching an ideal spring of natural length L to stretched length 1.5 L is W. How much energy is needed to compress it to length $\left(\frac{L}{4}\right)$?

(1) 2W (2) 1.5W
(3) 2.25W (4) 0.25W

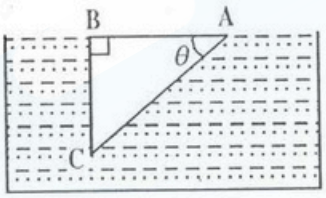
61. A pendulum clock gains 5 s per day at a temperature of 15°C and loses 10 s per day at a temperature 30°C. At what temperature, the pendulum clock will neither gain nor lose time?

(1) 18°C
(2) 20°C
(3) 22.5°C
(4) 25°C

62. The work done in an isothermal expansion from volume V to 10 V is W at temperature T. What is the work done for isothermal expansion from volume 10 V to 100 V at temperature T?

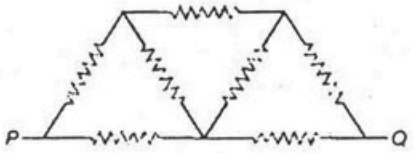
(1) W
(2) 2.3 W
(3) 9 W
(4) 10 W

63. A glass prism having refractive index 1.5 is immersed into water of refractive index $\frac{4}{3}$ as shown in the figure given above. A light beam incident normally on the face AB is totally reflected to reach the face BC if



(1) $\sin\theta > \frac{8}{9}$
(2) $\frac{2}{3} < \sin\theta < \frac{8}{9}$
(3) $\sin\theta < \frac{2}{3}$
(4) None of these

64. Seven resistors, each of 1Ω resistance are connected as shown in the figure. What is the effective resistance between points P and Q?

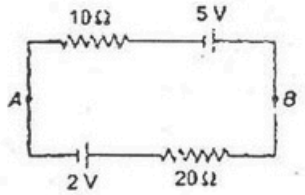


(1) $\frac{4}{7}\Omega$
(2) 7Ω
(3) $\frac{8}{7}\Omega$
(4) $\frac{3}{2}\Omega$

65. Two long wires are set parallel to each other. Each carries a current (i) in the same direction and the separation between them is 2r. What is the intensity of magnetic field midway between them?

(1) $\frac{4i}{r}$
(2) $\frac{2i}{r}$
(3) $\frac{i}{r}$
(4) Zero

66. What is the potential difference between the points A and B of the circuit shown below?



(1) −4 V (2) 4 V (3) 8 V (4) None of these

67. A nucleus of mass number A emits α-rays with kinetic energy E. What is the recoil energy of the daughter nucleus?

(1) $\frac{4E}{(A-4)}$ (2) $\frac{(A-4)E}{A}$ (3) $\frac{4E}{(A+4)}$ (4) $\frac{4E}{A}$

68. What is the order of the activity of 2g of ^{226}Ra whose half-life is 1622 yr?

(1) 10^{20} disintegrations per second (2) 10^{15} disintegrations per second
(3) 10^{10} disintegrations per second (4) 10^{5} disintegrations per second

69. A potentiometer wire of length 100 cm has a resistance of 10 Ω. It is connected in series with a resistance and a cell of emf 2 V and of negligible internal resistance. A source of emf 10 mV is balanced against a length of 40 cm of the potentiometer wire. What is the value of external resistance?

(1) 680 Ω (2) 790 Ω (3) 820 Ω (4) 890 Ω

70. A particle of mass m moves in a horizontal circle of radius r under the influence of a centripetal force given by $-Kr^{-2}$, where K is a constant. What is the energy of the particle?

(1) K/r (2) −K/2r (3) K/2r (4) −K/r

71. A car is driven by a constant power P. If the car moves over a distance x, then velocity attained by the car will be proportional to

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

72. An open organ pipe of length L vibrates in its fundamental mode. Where is the pressure variation maximum?

(1) At the two ends (2) The middle
(3) At L/4 from each end (4) At L/8 from each end

73. Three particles A, B, C are situated at the vertices of an equilateral triangle ABC of side d at t = 0. Each of the particles moves with constant speed v. A always has its velocity along AB, B along BC and C along CA. The time the particles meet each other is

(1) d/3v (2) 2d/3v (3) 3d/2v (4) d/v

74. When the speed of the particle increases by 2 units, the kinetic energy becomes doubled. What is the original speed of the particle?

(1) 2 unit (2) $\sqrt{2}$ unit (3) $2\left(\sqrt{2}+1\right)$ unit (4) $\sqrt{2}\left(\sqrt{2}+1\right)$ unit

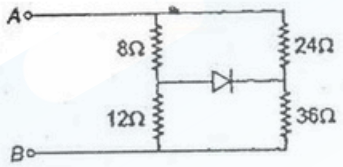
75. Each division on the main scale is 1 mm. Which one of the following vernier scales will give vernier constant equal to 0.01 mm?

(1) 9 mm divided by 10 divisions
(2) 95 mm divided by 100 divisions
(3) 99 mm divided by 100 divisions
(4) 9 mm divided by 100 divisions

76. The angle of incidence of a light ray on a plane mirror is reduced by 15°. The angle between the reflected ray and the incident ray becomes 90°. What was the original angle of incidence?

(1) 30° (2) 45° (3) 60° (4) 90°

77. What is the equivalent resistance between A and B in the given circuit?



(1) 15Ω
(2) 19.2Ω
(3) Depends upon whether diode is forward biased or reverse biased
(4) Cannot be determined because of insufficient data

78. A light ray is passing through a glass plate of thickness d and refractive index n. What is the time taken by the light to cross the glass plate? (c is the speed of light in vacuum)

(1) dnc (2) d/(nc) (3) dn/c (4) nc/d

79. At absolute zero, which one of the following is zero for a gas?

(1) Potential energy
(2) Kinetic energy
(3) Vibration energy
(4) None of these

80. How can a voltmeter be converted into an ammeter?

(1) By removing high resistance from parallel and connecting low resistance in series
(2) By removing high resistance from series and connecting low resistance in parallel
(3) By removing low resistance from parallel and connecting high resistance in series
(4) By removing low resistance from series and connecting high resistance in parallel

81. A magnetic needle is placed in a non-uniform magnetic field. The needle will experience
(1) A force but not a torque
(2) a torque but not a force
(3) Neither a force nor a torque
(4) Both force and torque

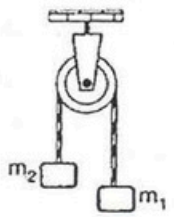
82. The expression for centripetal force depends upon mass of body, speed of the body and the radius of circular path. Find the expression for centripetal force
(1) $F = \frac{mv^2}{2r^3}$
(2) $F = \frac{mv^2}{r}$
(3) $F = \frac{mv^2}{r^2}$
(4) $F = \frac{m^2v^2}{2r}$

83. The maximum static friction on a body is $F = \mu N$.
Here, N= normal reaction force on the body μ = coefficient of static friction
The dimensions of μ is
(1) MLT^{-2}
(2) $M^0L^0T^0\theta^{-1}$
(3) dimensionless
(4) None of these

84. When the range of a projectile on an inclined plane is maximum then
(1) the focus of the path is on the plane
(2) the focus on the path is below the plane
(3) the focus of the path is above the plane
(4) the focus of the path lies at any place

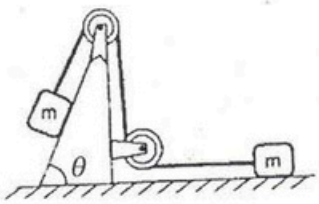
85. A motor boat covers the distance between two spots on the river banks in $t_1 = 8$ h and $t_2 = 12$ h in down stream and upstream respectively. The time required for the boat to cover this distance in still water will be
(1) 6.9 hr
(2) 9.6 hr
(3) 69 second
(4) 96 second

86. In the given figure



(1) acceleration of m_1 and m_2 are same
(2) the magnitude of relative acceleration of m_1 with respect to m_2 is twice the magnitude of acceleration of m_1
(3) the velocity of m_1 and m_2 are same
(4) the speed of m_1 and m_2 are not same

87. For the system shown in the figure, the pulleys are light and frictionless. The tension in the string will be



(1) $\frac{2}{3}mg\sin\theta$ (2) $\frac{3}{2}mg\sin\theta$ (3) $\frac{1}{2}mg\sin\theta$ (4) $2mg\sin\theta$

88. A bucket tied to a string is lowered at a constant acceleration of $\frac{g}{4}$. If the mass of the bucket is m and is lowered by a distance d, the work done by the string will be

(1) $\frac{mgd}{4}$ (2) $-\frac{3}{4}mgd$ (3) $-\frac{4}{3}mgd$ (4) $\frac{4}{3}mgd$

89. A small sphere of mass m is suspended by a thread of length l. It is raised upto the height of suspension with thread fully stretched and released. Then the maximum tension in thread will be

(1) mg (2) 2mg (3) 3mg (4) 6mg

90. A transverse wave of equation y=2 sin (0.01x + 30t) moves on a stretched string from one end to another end. In the equation of wave, x and y are in cm and t is in second. The time taken by wave to reach from one end to another end of string is 5 s. The length of string is

(1) 10 m (2) 100 m (3) 150 m (4) 160 m

91. Two simple harmonic motion are represented by the equations

$y_1 = 10\sin\left(3\pi t + \frac{\pi}{4}\right)$

and $y_2 = 5\left(3\sin 3\pi t + \sqrt{3}\cos 3\pi t\right)$

Their amplitudes are in the ratio of

(1) $\sqrt{3}$ (2) $1\sqrt{3}$ (3) 2 (4) 1/6

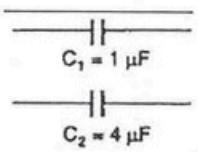
92. If two mirrors are inclined at some angle and an object is placed between the mirrors and there are 7 images formed for an object. Then what is angle between the mirrors

(1) 54° (2) 50° (3) 60° (4) 64°

93. A capacitor of capacitance C is charged to a potential difference V_0. The charge battery is disconnected and the capacitor is connected to a capacitor of unknown capacitance C_x. The potential difference across the combination is V. The value of C_x should be

(1) $\frac{C(V_0 - V)}{V}$ (2) $\frac{C(V - V_0)}{V}$ (3) $\frac{CV}{V_0}$ (4) $\frac{CV_0}{V}$

94. Two capacitors of capacitance C_1 and C_2 are charged to 60 V by connecting them across a battery. Now, they are disconnected from the battery and connected to each other with terminals of unlike polarity together. The final voltage across each capacitor is equal to



(1) 45 V (2) 36 V (3) 60 V (4) None of these

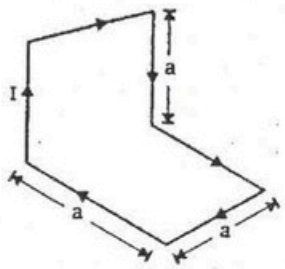
95. The resistance of a 50 cm long wire is 10 Ω. The wire is stretched to uniform wire of length 100 cm. The resistance now will be

(1) 15 Ω (2) 30 Ω (3) 20 Ω (4) 40 Ω

96. Copper and germanium are both cooled to 70 K from room temperature, then

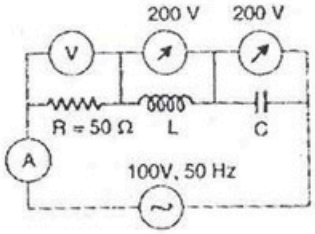
(1) resistance of copper increases while that of germanium decreases
(2) resistance of copper decreases while that of germanium increases
(3) resistance of both decreases
(4) resistance of both increases

97. The magnitude of magnetic moment of the current loop in the figure is



(1) Ia^2 (2) $\sqrt{2}Ia^2$ (3) zero (4) None of these

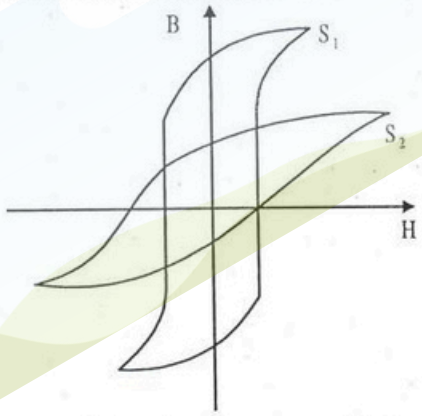
98. In the series LCR circuit, calculate the voltmeter and ammeter readings



(1) V = 250 V, I = 4 A
(2) V = 150 V, I = 2 A
(3) V = 1000 V, I = 5 A
(4) V = 100 V, I = 2 A

99. The electric field 'E' and magnetic field 'B' in electromagnetic waves are
(1) parallel to each other
(2) inclined at an angle of 45°
(3) perpendicular to each other
(4) opposite to each other

100. The *B-H* curves S_1 and S_2 in the adjoining figure are associated with



(1) a diamagnetic and paramagnetic substance respectively
(2) a paramagnetic and ferromagnetic substance respectively
(3) soft iron and steel respectively
(4) steel and soft iron respectively

101. A speaks truth in 75% and B in 80% of the cases. The percentage of cases in which they are likely to contradict each other is
(1) 20%
(2) 35%
(3) 15%
(4) 60%

102. Dialing a telephone number an old man forgets the last two digits remembering only that these are different dialled at random. The probability that the number is dialled correctly is
(1) 1/45
(2) 1/90
(3) 1/100
(4) None of these

103. The chance that a doctor A will diagnose a disease X correctly is 60%. The chance that a patient will die by his treatment after correct diagonosis is 40% and the chance of death by wrong diagnosis is 70%, A patient of doctor A who had disease X died. The chance that his disease was diagnosed correctly is

(1) $\frac{6}{10}$ (2) $\frac{6}{11}$ (3) $\frac{1}{2}$ (4) $\frac{6}{13}$

104. If A and B are events such that P(A∪B) = 0.5, P (not B) = 0.8 and P (A|B) = 0.4, then what is P(A) equal to?

(1) 0.38 (2) 0.32 (3) 0.28 (4) 0.22

105. What is the value of the error when $\frac{2}{11}$ is approximated by 0.18?

(1) $\frac{1}{55}$ (2) $\frac{1}{550}$ (3) $\frac{1}{110}$ (4) $\frac{1}{1100}$

106. If $\vec{a}$ and $\vec{b}$ are unit vectors, then what is $|\vec{a}+\vec{b}|^2+|\vec{a}-\vec{b}|^2$ equal to?

(1) 2 (2) $\sqrt{2}$ (3) $2\sqrt{2}$ (4) 4

107. An ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ slides between two perpendicular straight lines. What is the locus of its centre?

(1) Circle (2) Parabola (3) Ellipse (4) Hyperbola

108. Let $a > 0$, $b > 0$ and $c > 0$. Then, both the roots of the equation $ax^2 + bx + c = 0$

(1) are real and negative (2) have negative real parts

(3) have positive real parts (4) None of the above

109. AB is a vertical pole. The end A is on the level of ground. C is the middle point of AB. P is a point on the level of ground. The portion BC subtends an angle β at P. If AP = n(AB), then what is tan β is equal to?

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

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

110. If a cos A = b cos B then the triangle is

(1) equilateral
(2) right angled
(3) isosceles
(4) isosceles or right angled

111. The domain of the function $f(x) = \frac{1}{\sqrt{|x| - x}}$ is

(1) $(0, \infty)$
(2) $(-\infty, 0)$
(3) $(-\infty, \infty)$
(4) None of these

112. The function $f(x) = \log (x + \sqrt{x^2 + 1})$, is

(1) an even function
(2) an odd function
(3) a periodic function
(4) neither an even nor an odd function

113. The value of $\lim_{x \to \infty} \left(\frac{1 + 3x}{2 + 3x}\right)^{\frac{1 - \sqrt{x}}{1 - x}}$ is

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

114. The function $f(x) = (x)$, where (x) denotes the smallest integer $\geq x$, is

(1) continuous everywhere
(2) continuous at integral points only
(3) continuous at non-integral points only
(4) None of the above

115. If the capital letters denote the cofactors of the corresponding small letters in the determinant

$$\Delta = \begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix},$$ then the value of

$$\Delta' = \begin{vmatrix} A_1 & B_1 & C_1 \\ A_2 & B_2 & C_2 \\ A_3 & B_3 & C_3 \end{vmatrix}$$ is

(1) 0
(2) 2Δ
(3) Δ^2
(4) Δ

116. If $y = (1 + x^{1/4})(1 + x^{1/2})(1 - x^{1/4})$, then $\frac{dy}{dx} =$

(1) 1 (2) -1 (3) x (4) $\sqrt{x}$

117. For a differentiable curve $y = f(x)$ having atleast two extremum in the interval $[a, b]$,

(1) two of its maximum values occurs successively

(2) two of its minimum values occur successively

(3) maximum and minimum values occur alternatively

(4) None of the above

118. N characters of information are held on magnetic tape, in batches of x characters each; the batch processing time is $\alpha + \beta x^2$ seconds; α, β are constants. The optimum value of x for fast processing is

(1) $\frac{\alpha}{\beta}$ (2) $\frac{\beta}{\alpha}$ (3) $\sqrt{\frac{\alpha}{\beta}}$ (4) $\sqrt{\frac{\beta}{\alpha}}$

119. A private telephone company serving a small community makes a profit of ₹ 12 per subscriber, if it has 725 subscribers. It decides to reduce the rate by a fixed sum for each subscriber over 725, thereby reducing the profit by 1 paise per subscriber. Thus, there will be profit of ₹ 11.99 on each of the 726 subscribers, ₹ 11.98 on each 727 subscribers etc. The number of subscribers which will give the company the maximum profit, is

(1) 961 (2) 962 (3) 963 (4) None of these

120. The equation of the family of curves for which sub-normal is constant, is

(1) $y^2 = cx + k$ (2) $y^2 = 2cx + k$

(3) $x^2 = 2cy + k$ (4) None of these

121. Non zero equal numbers are in

(1) A.P. only (2) A.P. and G.P. only

(3) A.P.,G.P. and H.P. (4) A.P. and H.P. only

122. A car travels 25 km an hour faster than a bus for a journey of 500 km. If the bus takes 10 hours more than the car, then the speed of the car and the bus is

(1) 25 km/hr, 40 km/hr (2) 25 km/hr, 50 km/hr

(3) 25 km/hr, 60 km/hr (4) None of these

123. If X and Y are independent variables, then p (X, Y) is equal to

(1) 1 (2) -1

(3) 0 (4) None of these

124. The mean deviation of the numbers 3, 4, 5, 6, 7 is

(1) 25 (2) 5 (3) 1.2 (4) 0

125. A cask containing 425 litres lost 8% by leakage. How many litres were left in the cask?

(1) 34 litres (2) 391 litres (3) 334 litres (4) 389 litres

126. The average age of 24 boys and the teacher of a class is equal to 15 years. If the teacher left the class, the average age becomes 14. What is the age of the teacher?

(1) 45 years (2) 39 years (3) 25 years (4) 42 years

127. A bag contains coins of denominations one rupee, fifty paise and twenty five paise. The values of the coins of the three denominations are in the proportion of 2 : 3 : 4. If the total number of coins are 480 what is total amount of money in rupees?

(1) 180 (2) 120 (3) 190 (4) 170

128. In what proportion must water be mixed with spirit to gain $16\frac{2}{3}\%$ by selling it at cost price?

(1) 1 : 6 (2) 1 : 7 (3) 2 : 5 (4) 5 : 1

129. 300 gm of sugar solution has 40% sugar in it. How much sugar should be added to make it 50% in the solution?

(1) 40 gm (2) 45 gm (3) 25 gm (4) 60 gm

130. A can do a piece of work in 5 days, and B can do it in 6 days. If C, who can do the work in 12 days, joins them, how long will they take to complete the work?

(1) 6 days (2) $2\frac{2}{9}$ days (3) $3\frac{1}{5}$ days (4) None of these

131. The profit earned by selling an article for ₹ 600 is equal to the loss incurred when the same article is sold for ₹ 400. What should be the sale price of the article for making 25 percent profit?

(1) ₹ 625 (2) ₹ 700 (3) ₹ 524 (4) ₹ 200

132. A man buys 10 articles for ₹ 8 and sells them at the rate of ₹ 1.25 per article. His gain percent is

(1) 50% (2) $56\frac{1}{4}\%$ (3) $19\frac{1}{2}\%$ (4) 20%

133. A sum of money doubles itself in 10 years at simple interest. What is the rate of interest?

(1) 10% (2) 14% (3) 12% (4) 25%

134. A boy goes to school at a speed of 3 km/h and returns to the village at a speed of 2 km/h. If he takes 5 hours in all, what is the distance between the village and the school?

(1) 5 km (2) 15 km (3) 8 km (4) 6 km

135. In a stream flowing at 2 km/h, a motorboat goes 10 km upstream and back again to the starting point in 55 minutes. What is the speed of the motorboat in still water?

(1) 22 km/h (2) 15 km/h (3) 20 km/h (4) None of these

136. Length of a rectangular blackboard is 8 cm more than its breadth. If its length is increased by 7 cm and its breadth is decreased by 4 cm, its area remains unchanged. What is the length of the rectangular blackboard?

(1) 28 cm (2) 20 cm (3) 14 cm (4) 17 cm

137. The angle between two diagonals of a cube is equal to

(1) 45° (2) 60° (3) 30° (4) $\tan^{-1}\left(2\sqrt{2}\right)$

138. In a certain city two newspapers A and B are published. It is known that 25% of the city population reads A and 20% reads B while 8% reads both A and B. It is also known that 30% of those who read A but not B look into advertisements and 40% of those who read B but not A look advertisements while 50% of those who read both A and B look into advertisemets. What is the percentage of the population who reads an advertisement?

(1) 11% (2) 13% (3) 15% (4) 13.9%

139. What is the degree of the differential equation obtained from $y = cx^2 + c^{-1}$, where c is an arbitrary constant?

(1) 4 (2) 3 (3) 2 (4) 1

140. If A and B are two events such that $P(A \cup B) = \frac{1}{2}$ and $P(\bar{A}) = \frac{2}{3}$, then what is $P(\bar{A} \cap B)$?

(1) $\frac{1}{3}$ (2) $\frac{2}{3}$ (3) $\frac{1}{2}$ (4) $\frac{1}{6}$

141. The probability that a regularly scheduled flight departs on time is 0.80, the probability that it arrives on time is 0.70 and the probability that it departs and arrives on time is 0.60. What is the probability that a plane arrives on time given that it departed on time?

(1) 0.75 (2) 0.90 (3) 0.42 (4) 0.56

142. A wall measures 40 m by 30 m contains a window of size 15 m by 10 m. The wall is hit by four stones thrown up by a mower. Assuming that each stone hits the wall in a random position independently of other stones, what is the probability that every throw hits the window?

(1) 1/8 (2) 1/4096 (3) 2401/4096 (4) 1/512

143. If $\hat{a}, \hat{b}, \hat{c}$ are three unit vectors such that $\hat{a} + \hat{b} + \hat{c} = \vec{0}$, then what is the value of $\hat{a} \cdot \hat{b} + \hat{b} \cdot \hat{c} + \hat{c} \cdot \hat{a}$?

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

144. The frequency distribution of a variate X is as follows

X	11	13	17	21	25
Frequency	13	25	11	17	21

What is the median of the above distribution?

(1) 13 (2) 17 (3) 21 (4) 25

145. The derivative of an odd function is always

(1) an even function (2) an odd function

(3) does not exist (4) None of the above

146. The minimum value of $\log_a x + \log_x a$, $0 < x < a$, is

(1) 1 (2) 2 (3) -2 (4) None of these

147. AB is a diameter of a circle and C is any point on the circumference of the circle, then

(1) area of ΔABC is maximum when it is an isosceles.

(2) area of ΔABC is minimum when it is an isosceles.

(3) the perimeter of ΔABC is minimum when it is isosceles.

(4) the perimeter of ΔABC is maximum when it is isosceles.

148. The degree of differential equation

$$x = 1 + \left(\frac{dy}{dx}\right) + \frac{1}{2!}\left(\frac{dy}{dx}\right)^2 + \frac{1}{3!}\left(\frac{dy}{dx}\right)^3 + \ldots\ldots \text{ is}$$

(1) three (2) one

(3) not defined (4) None of these

149. The Arithmetic mean, Geometric mean and Harmonic mean between two positive real quantities are themselves in

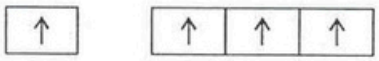
(1) A.P. (2) G.P.

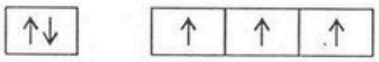
(3) H.P. (4) No particular order

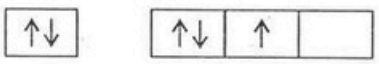
150. In a network of railways, a small island has 15 stations. The number of different types of tickets to be printed for each class, if every station must have tickets for other station, is

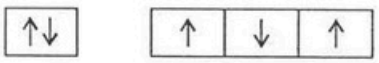
(1) 230 (2) 210 (3) 340 (4) None of these

151. In which of the following orbital diagram Aufbau principle is violated

(1) 

(2) 

(3) 

(4) 

152. Which one of the statements is most appropriate ?

(1) electron spins around its own axis only.

(2) electron moves around the nucleus in spherical orbits.

(3) electron moves around the nucleus in elliptical orbits.

(4) electron moves around the nucleus in spherical or elliptical orbits and spins around its own axis.

153. Two elements x (at.mass 75) and y(at.mass 16) combine to give a compound having 75.8% x. The formula of the compound is

(1) xy (2) x_2y (3) x_2y_2 (4) x_2y_3

154. Which of the following statement is not true about NaCl structure ?

(1) Cl^- ions are in fcc arrangement

(2) Na^+ ions have co-ordination number four

(3) Cl^- ions have co-ordination number six

(4) Each unit cell contains 4 NaCl molecules

155. A chemical process is carried out in a thermostat maintained at 25°C. The process may be termed as

(1) isobaric process (2) isothermal process

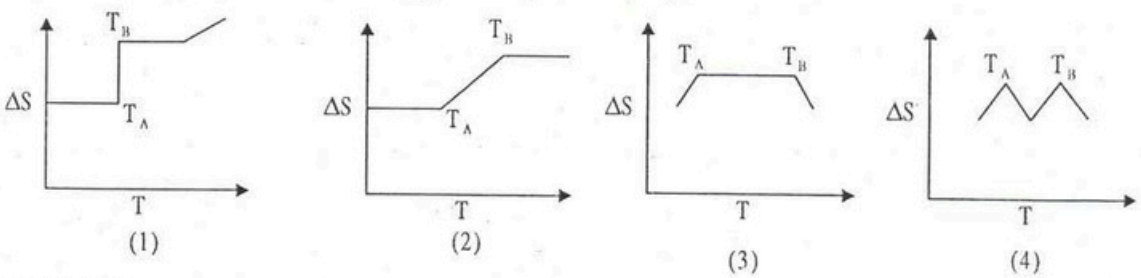
(3) isoentropic process (4) adiabatic process

156. "If a system A is in thermal equilibrium with B and B is in thermal equilibrium with C, then A is in thermal equilibrium with C." This is a statement of

(1) Cyclic rule (2) Zeroth law of thermodynamics

(3) First law of thermodynamics (4) Second law of thermodyamics

157. If for a given substance, melting point is T_B and freezing point is T_A then correct variation of entropy by graph between entropy change and temperature is



158. The equilibrium constant K, for the reaction
$2HI\ (g) \rightleftharpoons H_2\ (g) + I_2(g)$ at room temperature is 2.85 and that at 698 K is 1.4×10^{-2}. This implies that the forward reaction is

(1) exothermic (2) endothermic (3) exergonic (4) unpredictable

159. The ionic-product of water will increase if

(1) pressure is decreased (2) H^+ ions are added
(3) OH^- ions are added (4) temperature is increased

160. For a first order reaction, the half-life period is independent of

(1) initial concentration (2) cube root of initial concentration
(3) first power of final concentration (4) square root of final concentration

161. The half-life period of a first order process is 1.6 minutes. It will be 90% complete in

(1) 0.8 min. (2) 3.2 min. (3) 5.3 min. (4) 1.6 min.

162. An azeotropic mixture of two liquids has boiling point lower than either of them when it

(1) shows a negative deviation from Raoults' law
(2) shows no deviation from Raoults' law
(3) shows positive deviation from Raoult's law
(4) is saturated

163. When a beam of light is passed through colloidal solution

(1) it gets scattered (2) it gets adsorbed
(3) it is refracted (4) it undergoes reflection

164. In the titration between oxalic acid and acidified $KMnO_4$, the manganous salt formed, catalyses the reaction. The manganous salt is

(1) a promoter (2) a positive catalyst
(3) an autocatalyst (4) None of the above

165. The quantity of electricity required to liberate 0.1 g. equivalent of an element at the electrode is

(1) 9650 coulomb (2) 96500 coulomb
(3) 965 coulomb (4) 96.5 coulomb

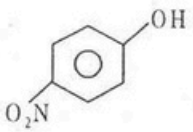
166. Stronger the oxidising agent, greater will be the

(1) reduction potential (2) oxidation potential
(3) ionic behaviour (4) None of these

167. Neutrons are more effective projectiles than protons because they

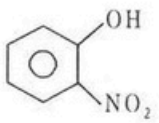
(1) are attracted by the nuclei
(2) are not repelled by the nuclei
(3) travel with high speed
(4) None of the above

168. For the given two compounds, vapour pressure of B at a particular temperature is expected to be



(A)

and



(B)

(1) higher than that of A
(2) lower than that of A
(3) same as that of A
(4) can be higher or lower depending upon the size of the vessel

169. An ionic solid is poor conductor of electricity because

(1) ions do not conduct electricity
(2) charge on the ions is uniformly distributed
(3) ions have uniform field of influence around it
(4) ion occupy fixed position in solids

170. Ionisation potential of the atom is not affected by which of the following ?

(1) atomic size
(2) penetration effect
(3) electron neutrality with protons
(4) nuclear charge

171. Which is not a π-bonded complex ?

(1) Zeisse's salt
(2) Ferrocene
(3) Dibenzene chromium
(4) Tetraethyl lead

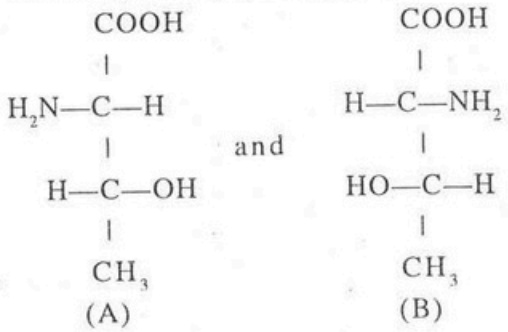
172. Phosphine is not evolved when

(1) white phosphorus is boiled with strong solution of $Ba(OH)_2$
(2) orthophosphorus acid is heated
(3) calcium hydro phosphorus is heated
(4) metophosphoric acid is heated

173. Density of nitrogen gas prepared from air is slightly greater than that of nitrogen prepared by a chemical reaction from a compound of nitrogen due to the presence of the following in the aireal nitrogen

(1) argon
(2) carbon dioxide
(3) some N_2 molecules analogous to O_2
(4) greater amount of N_2 molecules derived from N-15 isotope

174. The compound (A) and (B) are



(A) and (B)

(1) conformational isomers

(2) enantiomers

(3) geometric isomers

(4) identical molecules

175. Anhydrous calcium chloride cannot be used for drying ethanol, because

(1) anhydrous calcium chloride is not a dehydrating agent

(2) anhydrous calcium chloride does not exhibit deliquescent property

(3) calcium chloride give calcium ethoxide with ethanol

(4) it forms an addition compound with ethanol [$CaCl_2 . 4C_2H_5OH$]

176. Which of these statements is not true for alcohols ?

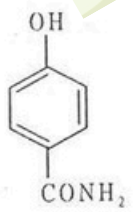
(1) Lower alcohols have fiery pungent and strong smell.

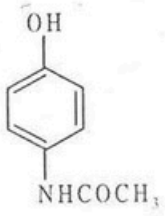
(2) As molecular mass increases, boiling point also increases.

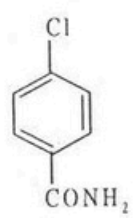
(3) Lower alcohols are water insoluble and their solubility increases with molecular weight.

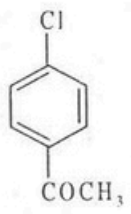
(4) Lower alcohols are water soluble and their solubility decreases with molecular weight.

177. The correct structure of the drug paracetamol is

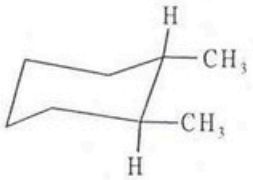
(1) 

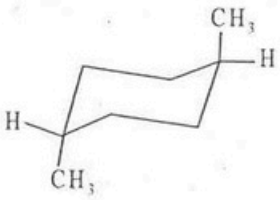
(2) 

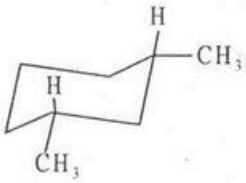
(3) 

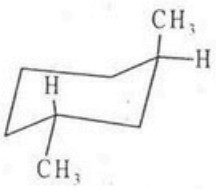
(4) 

178. Which of the following is a cis-isomer ?

(1) 

(2) 

(3) 

(4) 

179. Which one of the following statement is false ?

(1) Violet radiations have a longer wavelength than red radiations

(2) The energy of light with λ = 600 nm is lower than that with λ = 500 nm

(3) Spectrum of an atom is known as line spectrum

(4) The wavelength associated with an electron is longer than that of proton if they have the same speed

180. When an electron is moving uniformly, it produces

(1) both electric and magnetic fields.
(2) an electric field only.
(3) a magnetic field only.
(4) no such fields.

181. The pair of substance which illustrates the law of multiple proportions ?

(1) CO and CO_2
(2) NaCl and NaBr
(3) H_2O and D_2O
(4) Mg_2O and $Mg(OH)_2$

182. Which type of the crystals are softest and have the lowest melting points ?

(1) Molecular crystals
(2) Ionic crystals
(3) Metallic crystals
(4) Covalent crystals

183. When ammonium chloride is dissolved in water, the solution becomes cold. The change is

(1) endothermic
(2) exothermic
(3) supercooling
(4) None of the above

184. When pressure is applied to the equilibrium system

Ice $\rightleftharpoons$ water

Which of the following phenomenon will happen?

(1) More ice will be formed
(2) Water will evaporate
(3) Equilibrium will not be established
(4) More water will be formed

185. Among the following reactions, the fastest one is

(1) burning of coal

(2) rusting of iron in moist air

(3) conversion of monoclinic sulphur to rhombic sulphur

(4) precipitation of silver chloride by mixing silver nitrate and sodium chloride solution

186. If initial concentration is doubled, the time for half reaction is also doubled, the order of reaction is

(1) zero (2) first (3) second (4) third

187. The increase in the molar conductivity of acetic acid with dilution is due to

(1) decrease in interionic forces (2) increase in degree of ionisation

(3) increase in self ionisation of water (4) None of these

188. In which of the following, the corrosion of iron will be most rapid ?

(1) In pure water (2) In pure oxygen

(3) In air and moisture (4) In air and saline water

189. With the passage of time, the rate of radioactive disintegration

(1) increases (2) decreases

(3) remains same (4) may increase or decrease

190. Paramagnetism is exhibited by molecules which

(1) are not attracted by magnetic field (2) contain unpaired electrons

(3) carry positive charge (4) contain only paired electrons

191. Which one of the following is true for $AlCl_3$. $AlCl_3$ is predominantly covalent because it has

(1) high charge on cation (2) small size of cation

(3) large size of anion (4) All of the above

192. The set that contains pairs of elements that do not belong to same group but show chemical resemblence is

(1) B, Al (2) Be, Al (3) Hf, Zr (4) K, Pb

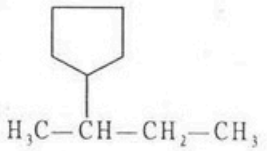
193. Mg is an important component of which biomolecule occuring extensively in living world ?

(1) Haemoglobin (2) Chlorophyll (3) Florigen (4) ATP

194. A piece of magnesium ribbon was heated to redness in the atmosphere of nitrogen. The compound formed when cooled and treated with water gave

(1) hydrogen (2) oxygen (3) ammonia (4) nitrogen

195. IUPAC name of



(1) 2-cyclopentyl butane
(2) 2-phenyl butane
(3) 1-butyl cyclohexane
(4) 3-cyclopentyl butane

196. 95% alcohol is nothing but

(1) methylated spirit
(2) denatured spirit
(3) power alcohol
(4) rectified spirit

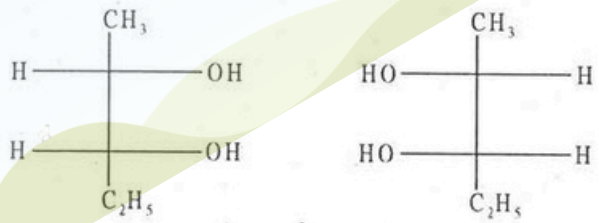
197. A cylinder of compressed gas that bears no label is supposed to contain either ethane or ethene. Combustion of the sample shows that 16 cm^3 of the gas require 48 cm^3 of oxygen for complete combustion. This shows that the gas is

(1) only ethane
(2) only ethene
(3) 1:1 mixture of two gases
(4) some unknown mixtures of the two gases

198. When salicylic acid is treated with acetic anhydride, we get

(1) aspirin
(2) paracetamol
(3) salol
(4) None of these

199. The following two compounds are



(1) Enantiomers
(2) Diastereomers
(3) Identical
(4) Epimers

200. In practical organic chemistry tetramethyl-silane is used mainly for

(1) Making volatile derivatives of alcohols
(2) A spectroscopic standard
(3) A solvent for infrared spectra
(4) An antiknock in gasolines