

IBA Past Entry Test Papers

MS – 2010

Section: English

Number of Questions: 45 Time allowed: 45 Minutes

Section: Mathematics

Number of Questions: 50 Time allowed: 75 Minutes

Section: Computer Science

Tasks: 40 Time allowed: 50 Minutes

Negative Marking: Yes

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ALL ANSWERS MUST BE GIVEN ON THE COMPUTERIZED ANSWER SHEET
BY CROSSING THE CORRESPONDING LETTER
PART I - ENGLISH M.C.Q'S

Number of Questions: 45

Questions on Page Numbers: 1 To 8

Time Allowed: 45 Minutes

Negative Marking: Yes

Q 1-15 Fill in the blanks with suitable word given at the end of the text.

If you work at a business where managers from different geographic locations meet on a regular basis, you __Q1__ your company a fortune in travel costs __Q2__ a really ingenious technology that you probably don't know about. The technology I am talking about is modern conference call technology.

Companies are spending __Q3__ sending managers from one location to another to meet regularly with executives and also other managers. This is an extremely costly process. __Q4__ do you have to consider the out of pocket costs of all that traveling, __Q5__ also need to consider the opportunity cost of those meetings as well. All of that time that these managers and executives are spending at airports, waiting in lines for rental cars, recovering lost luggage, checking into hotels, etc. could be time __Q6__ on business matters that provide value to the company. They could be looking over reports, managing employees or talking with customers. Wouldn't you agree that these tasks are more beneficial than having that person away for a day or two while he is traveling?

In case you haven't caught up on things recently, there are ways that you can __Q7__ those meetings without taking your manager out of town, without wasting all that travel time and without wasting all of that money. You could start holding those less than vital meetings over the telephone or over the computer. The technology to do this has been around for a good long time, but it is still under-utilized.

These teleconferencing services __Q8__ dramatically over the years __Q9__ the internet as part of their service. You can __Q10__ on projects by showing Power Point presentations __Q11__ internet while you are conducting your meeting. You can even record the whole thing so that if one person __Q12__ to attend the meeting, that person can view the meeting after the fact __Q13__ to their own schedule. How is that compared to the system you are using right now?

The other major advantage is the __Q14__ of it all. If you need to __Q15__ emergency meeting to respond to some major event, this kind of service gives you that opportunity without having to book a bunch of last minute flights.

Q1

- A) should save
- B) have to save
- C) could save
- D) are to save

Q2

- A) with using
- B) by using
- C) for using
- D) and using

Q3

- A) a ransom
- B) a fortune
- C) a lifetime
- D) an eternity

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Q4

- A) However
- B) Unfortunately
- C) Not only
- D) Therefore

Q5

- A) then you
- B) when you
- C) if you
- D) but you

Q6

- A) better spent
- B) more spent
- C) better spending
- D) more spending

Q7

- A) accommodate
- B) acknowledge
- C) accomplish
- D) accentuate

Q8

- A) shall improved
- B) will improved
- C) have improved
- D) has improved

Q9

- A) by incorporating
- B) by inculcating
- C) with inducing
- D) with encouraging

Q10

- A) compromise
- B) consolidate
- C) collaborate
- D) cooperate

Q11

- A) for the
- B) over the
- C) by the
- D) with the

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Q12

- A) wasn't able
- B) hasn't able
- C) can't able
- D) won't able

Q13

- A) because
- B) according
- C) however
- D) therefore

Q14

- A) approachability
- B) congeniality
- C) rationality
- D) flexibility

Q15

- A) call to
- B) call for
- C) call that
- D) call an

Q 16-25 Choose the best option

Q16 If she _____ about his financial situation, she would have helped him out.

- A) knew
- B) had been knowing
- C) had known
- D) have known

Q17 I'll _____ their cat while they are away on holiday.

- A) be looking into
- B) be looking at
- C) be looking after
- D) be looking over

Q18 In the late 1970's and early 1980's, the United States developed the reusable space shuttle _____ to space cheaper and easier.

- A) to make access
- B) and making access
- C) which made accessible
- D) and made accessible

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- Q19 Genetically, the chimpanzee is more similar to humans _____.
A) are than any other animal
B) than is any other animal
C) any other animal is
D) and any other animal is
- Q20 _____ more than 65,000 described species of protozoa, of which more than half are fossils.
A) Being that there are
B) There being
C) Are there
D) There are
- Q21 Modern skyscrapers have a steel skeleton of beams and columns _____ a three-dimensional grid.
A) forms
B) from which forming
C) and forming
D) that forms
- Q22 The average level of United States prices grew very little from 1953 until the mid-1960's when _____.
A) did inflation begin
B) inflation began
C) the beginning of inflation
D) did the beginning of inflation
- Q23 The basis premise behind all agricultural production is _____ available the riches of the soil for human consumption.
A) to be made
B) the making
C) making is
D) to make
- Q24 _____ to the united states House of Representatives in 1791, Nathaniel Macon remained in office until 1815.
A) Election
B) Why he was elected
C) Elected
D) Who was elected
- Q25 The universe is estimated _____ between 10 billion and 20 billion years old.
A) being
B) to be
C) which is
D) is

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Q 26-35 Select the best option

Q26 The long dark days and lack of a job made him feel _____.

- A) alarmed
- B) excited
- C) depressed
- D) dissatisfied

Q27 In Sweden, public _____ of official documents is widespread.

- A) agony
- B) defy
- C) scrutiny
- D) litany

Q28 With her red hair and lively, outgoing manner, she was a _____ character.

- A) ugly
- B) tearful
- C) flamboyant
- D) secretive

Q29 She never knew whether her husband would be in an angry or cheerful mood as he was such a _____ character.

- A) volatile
- B) passive
- C) lazy
- D) voluble

Q30 The aim of the American Civil War was to _____ the slaves.

- A) validate
- B) inaugurate
- C) emancipate
- D) liquidate

Q31 The youths came _____ insolently into the room.

- A) dragging
- B) slouching
- C) driving
- D) twiddling

Q32 The judge imposed a light sentence in view of the _____ circumstances.

- A) unfair
- B) extensive
- C) extenuating
- D) qualifying

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Q33 Five readers _____ the correct solution to our recent competition.

- A) communicated
- B) qualified
- C) submitted
- D) subscribed

Q34 Many local authorities realize there is a need to make _____ for disabled people in their housing programmes.

- A) assistance
- B) conditions
- C) admittance
- D) provision

Q35 The government's new safety pamphlet _____ against smoking in bed.

- A) declares
- B) advises
- C) emphasizes
- D) stresses

Reading Comprehension

Choose the best answer for each passage

Erosion is regarded not merely as the physical removal of soil by water and wind, but rather as the deterioration of all the component parts of the habitat in which man and his crops and livestock have to exist. Since there is no conclusive evidence for any major climatic change in historic times to explain this deterioration, we must conclude that the eroding of the total environment has been due primarily to thoughtless destruction of the vegetative cover. This has led to deterioration of the microclimate above and below the surface, generally in the direction of a general drying out of the soil which has exposed it to erosive action of wind and rainfall of high intensity or frequency, and to the loss of organic matter in the soil, thus reducing its capacity to resist erosion by conserving the water that falls on the surface. If everything possible is done within the total environment to conserve the naturally planted or cultivated vegetation, this will also ensure optimal conservation of soil and water.

Q36 It is argued in the passage that the impoverishment of the world's habitat

- A) is first and foremost due to man's irresponsible abuse of the vegetable cover of the earth
- B) is largely due to gradual changes in climate over long years
- C) became inevitable as soon as agricultural and animal husbandry developed
- D) cannot be remedied

Q37 The definition of erosion given in this passage

- A) is a strictly regional one
- B) disregards man's role in it
- C) concentrates on flooding
- D) is a broad one

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Q38 It is pointed out in the passage that the loss of organic matter in the soil

- A) led to the destruction of the world's vegetative cover
- B) is a direct result of insufficient rain
- C) is an irreversible process
- D) has made the soil more susceptible to erosion

There was an increase of about 10% in the investment in the public sector, like electricity, irrigation, quarrying, public services and transport; even though the emphasis leaned towards transport and away from the other sectors mentioned. A 16-17% growth in investment, including a 30% increase in investment in business premises has been recorded in trade and services. Although there continued to be a decline in the share of agriculture in total gross investment in the economy, investment grew by 9% in absolute terms, largely spurred on by a 23% expansion of investment in agriculture equipment. Housing construction had 12% more invested in it in 1964, not so much owing to increased demand, as to fears of impending new taxes and limitation of building.

There was a rise of close to 11% in the total consumption in real terms during 1964 and per capita personal consumption by under 7%, as in 1963. The undesirable trend towards a rapid rise in consumption, evident in previous years, remains unaltered. Since at current prices consumption rose by 16% and disposable income by 13%, there was evidently a fall in the rate of saving in the private sector of the economy. Once again a swift advance in the standard of living was indicated in consumption patterns. Though fruit consumption increased, expenditure on food, especially bread and staple items, declined significantly. There was a continuing increase in the outlay on furniture and household equipment, health, education and recreation. The greatest proof of altered living standards was the rapid expansion of expenditure on transport (including private cars) and personal services of all kinds, which occurred during 1964. The changing composition of purchased durable goods demonstrated the progressive affluence of large sectors of the public. On the one hand increased purchase of automobiles and television sets were registered, a point of saturation was rapidly being approached for items like the first household radio, gas cookers, and electric refrigerators.

Q39 It is possible to conclude from this passage, that the people of the country were

- A) spending more money than they earn
- B) investing and consuming at an accelerated pace
- C) saving more money than previously
- D) spending their money wisely

Q40 According to the author the trend towards a rapid rise in consumption is "undesirable" as:

- A) there was an increase in the expenditure on frills and luxuries
- B) the people were affluent
- C) there was a rise in the standard of living
- D) people were saving less

Q41 The area, which saw the greatest expenditure of investment funds was

- A) The public sector
- B) Business premises
- C) Housing construction
- D) A field which cannot be determined

The Food and Drug Administration has formulated certain severe restrictions regarding the use of antibiotics, which are used to promote the health and growth of meat animals. Though the different types of medicines mixed with the fodder of the animals kills many microorganisms, it also encourages the appearance of bacterial strains, which are resistant to anti-infective drugs.

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It has already been observed that penicillin and the tetracyclines are not as effective therapeutically as they once used to be. This resistance to drugs is chiefly caused due to tiny circlets of genes, called plasmids, which are transferable between different species of bacteria. These plasmids are also one of the two kinds of vehicles on which molecular biologists depend on while performing gene transplant experiments. Existing guidelines also forbid the use of plasmids, which bear genes for resistance to antibiotics, in the laboratories. Though congressional debate goes on as to whether these restrictions need to be toughened with reference to scientists in their laboratories, almost no congressional attention is being paid to an ill advised agricultural practice, which produces deleterious effects.

Q42 In the present passage, the author's primary concern is with:

- A) The discovery of methods, which eliminate harmful microorganisms without generating drug-resistant bacteria.
- B) Attempting an explanation of the reasons for congressional inaction about the regulation of gene transplant experiments.
- C) Portraying a problematic agricultural practice and its serious genetic consequences
- D) The verification of the therapeutic ineffectiveness of anti-infective drugs

Q43 As inferred from the above passage, the mutual transfer of plasmids between different bacteria can result in which of the following?

- A) Microorganisms, which have an in-built resistance to drugs
- B) Therapeutically useful circlets of genes
- C) Penicillin like anti-infective drugs
- D) Viruses used by molecular biologists

Q44 The attitude the author has with reference to the development of bacterial strains that render antibiotic drugs ineffective can best be described as

- A) indifferent
- B) perplexed
- C) pretentious
- D) apprehensive

Q45 According to the above passage the author believes that those who favor the stiffening of restrictions on gene transplant research should logically also.

- A) Approve and aid experiments with any plasmids except those, which bear genes for antibiotic resistance.
- B) Inquire regarding the addition of anti-infective drugs to livestock feeds
- C) Oppose the using of penicillin and tetracyclines in order to kill microorganisms
- D) Agree to the development of meatier live-stock through the use of antibiotics

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PART II - Mathematics M.C.Q'S**

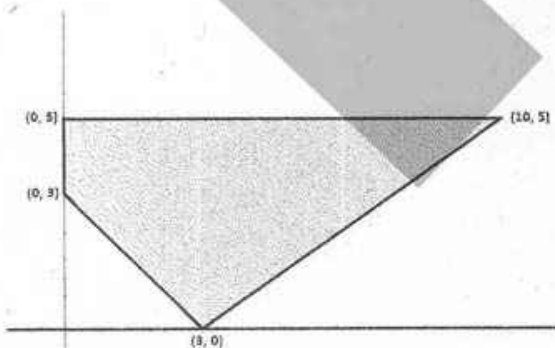
Number of Questions: 50

Time Allowed: 75 Minutes

Questions on Page Numbers: 9 To 14

Negative Marking: Yes

46. Amongst the teaching staff of ABC University the ratio of men to women is 5 to 2. Amongst the women teachers three seventh are not married. If the number of married women teachers is 56 then the total number of teachers is _____
(A) 98 (B) 343 (C) 245 (D) 560
47. A team of eleven spies were assigned consecutive whole numbers divisible by eleven as their identity codes. For telephonic contact they have to use contact code that equals the product of the middle of the identity codes and the sum of all identity codes of the eleven spies. If last of the identity codes is 209 then the contact code is _____
(A) 260874 (B) 154 (C) 1694 (D) 209
48. The value of a particular stock increased by 10% every day of the first four days of a week. However, its value decreased by 30% at the end of fifth day compared to its value at the end of the fourth day. If at the end of the fifth day the value of the stock was \$56 what was the value of the stock at the end of the second day?
(A) \$66.11 (B) \$72.73 (C) \$54.64 (D) \$60.1
49. Given the system of linear equations $x + 2y + 3z = 4$, $4x + 5y + 6z = 7$, $7x + 8y + 9z = 10$. One of the following is not a solution of this system.
(A) $(-2, 3, 0)$ (B) $(-1, 1, 1)$ (C) $(0, -1, 2)$ (D) $(0, 1, 1)$
50. Two cars started their journey from points A and B 150 km apart on the same road towards each other. The car started from A travelled at a constant speed 10km/hr more than that of the other car that also travelled at a constant speed. The two cars crossed each other after 72 minutes. What was the speed of the car that started from B?
(A) 58km/hr (B) 81km/hr (C) 57.5km/hr (D) 57km/hr
51. The equation of straight line that passes through the point A (midpoint of $(2, 3)$ and $(-8, 15)$) and point B (that lies one-third the way from $(-1, 0)$ to $(4, 11)$) is given by _____
(A) $y = 9 - \frac{16}{11}(x - 3)$ (B) $y = -9 - \frac{16}{11}(x - 3)$ (C) $y = 9 - \frac{16}{11}(x + 3)$ (D) $y = 9 - 16(x + 3)$



52. The shaded region in the figure above is represented by _____
(A) $x + y \leq 3, y \leq 5, 5x - 7y \leq 15$ (B) $x + y \leq 3, y \leq 5, 5x - 7y \geq 15$
(C) $x + y \geq 3, y \leq 5, 5x - 7y \leq 15$ (D) $x + y \geq 3, y \geq 5, 5x - 7y \leq 15$

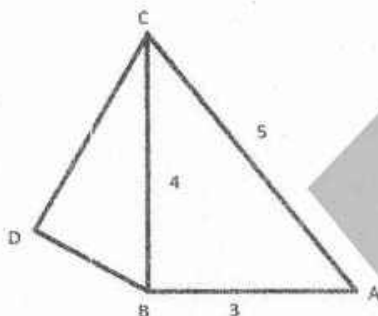
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PART II - Mathematics M.C.Q'S

Scores	Frequency
40-49	12
50-59	21
60-69	32
70-79	29
80-89	25
90-100	9

53. The table above shows the marks obtained by students in a mathematics course. The median of the marks scored exceeds the mean of the marks scored by _____.
(A) 3.89 (B) 11.06 (C) 0.92 (D) None of these
54. A cube with length of one side equal to 10 is centered at the origin. A line parallel to z-axis intersects the x-axis at 3. The line also intersects the cube at _____.
(A) (3, 0, 5) only (B) (3, 0, 5) and (3, 0, -5) (C) (3, 0, -5) only (D) no point.
55. Which of the following has the greatest value?
(A) 2^{64} (B) 4^{63} (C) 8^{34} (D) 16^{17}
56. Given $f(x) = 4x^2 + 4x + 12$, the coordinates of the highest point reached by the graph is _____.
(A) $(-0.5, \frac{45}{4})$ (B) $(-0.5, 11)$ (C) $(-\frac{1}{2}, \frac{47}{4})$ (D) $(0, \frac{47}{8})$
57. If $x \bmod y$ is the remainder when x is divided by y , then $(57 \bmod 6)^2 - (5 \bmod 4)^{100} =$ _____.
(A) 16 (B) 15 (C) 2 (D) 8
58. $f(x) = |x - 2| + |3 - x|$ then for all $x \geq 3$ _____.
(A) $f(x) = -2x + 5$ (B) $f(x) = 1$ (C) $f(x) = 2x - 5$ (D) None of these
59. If $i = \sqrt{-1}$, then $|(4 - 3i)(1 - i2)^2| =$ _____.
(A) 25 (B) 5 (C) $5\sqrt{5}$ (D) None of these.
60. Two identical rectangular solids each of dimension 3 X 4 X 5 are joined together so that the new rectangular solid has the longest side equal to 10. The ratio of the lengths of the diagonals of the new solid to that of one of the original solid is _____.
(A) 5:2 (B) 2:5 (C) $\sqrt{5}:\sqrt{2}$ (D) None of these
61. If the perimeter of a rectangle is 160 meters and its area is 1200 square meter, then one of its sides must be _____ the other side.
(A) one-third of (B) half of (C) double (D) one-tenth of
62. If $\omega = \frac{-1+i\sqrt{3}}{2}$ then $\frac{\omega^{13} + \omega^{12} + \omega^{11}}{10} =$ _____.
(A) 0.1 (B) 0 (C) -1 (D) 1
63. At least one of the following lines is perpendicular to the line $3x - 12y = 12$.
(A) $4x - y = -1$ (B) $4x + y = -1$ (C) $-4x + y = -1$ (D) $3x + 12y = 0$

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64. The triangles ABC and BDC are similar triangles. The lengths of the sides of the triangle ABC are indicated. The area of the plane quadrilateral ABDC is _____.
(A) 9.84 (B) 60 (C) 38.4 (D) 17.6

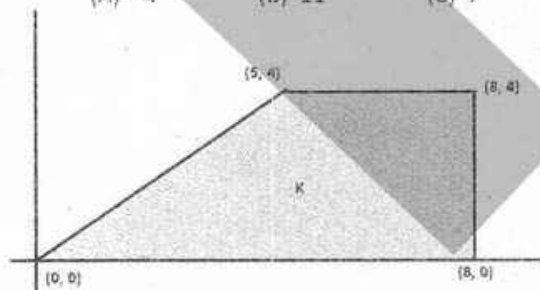
65. If $\log_3 9x + \log_2 4x = 0$, then _____.
(A) $x = 1$ (B) $\log_3 x + \log_2 x = -4$ (C) $x = 0$ (D) None of these

66. If $f(x) = \frac{1}{\sqrt{36-x^2}}$, then the domain of f is given by _____.
(A) $\{x: -6 \leq x \leq 6\}$ (B) $\{x: -6 < x < 6\}$ (C) $\{x: 0 < x < 6\}$ (D) $\{x: -6 \leq x < 0\}$

67. If two vertices of an isosceles triangle are $(2, 3)$ and $(5, 3)$ and the height of the triangle is 10 then the area of the triangle is _____.
(A) 10 (B) 30 (C) 15 (D) 16

68. The equation of the straight line joining the points of intersections of $x^2 + y^2 = 12$ and $x^2 - y^2 = 4$ that is below x-axis given by _____.
(A) $x = 2\sqrt{2}$ (B) $y = 2$ (C) $y = -2\sqrt{2}$ (D) $y = -2$

69. If a function is defined as $f(x) = \begin{cases} x^2 + x - 2 & \text{for } x > 0 \\ -x + 3 & \text{for } x \leq 0 \end{cases}$ then $f(2) + f(-4) =$ _____.
(A) 4 (B) 11 (C) 7 (D) None of these



70. In the figure above K represents the set of all points in the shaded region. The area of this shaded region that lies below the line $4x + 3y = 32$ is _____.
(A) 12 (B) 24 (C) 16 (D) 6

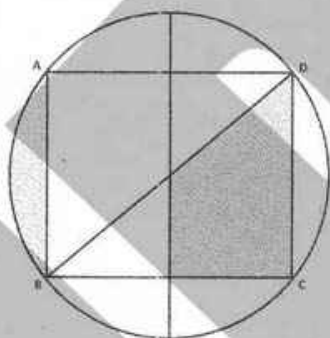
71. If $f(x) = \frac{x-1}{x+1}$ then $f^{-1}(x) =$ _____.
(A) $\frac{x-1}{x+1}$ (B) $\frac{x+1}{x-1}$ (C) $\frac{-1}{f(x)}$ (D) $\frac{1}{f(x)}$

72. If $\det(A) = \begin{vmatrix} a & d & g \\ b & e & h \\ c & f & i \end{vmatrix}$, then $\begin{vmatrix} a & 2d & 3g \\ b & 2f & 3i \\ c & 2e & 3h \end{vmatrix} =$ _____.
(A) $2\det(A)$ (B) $3\det(A)$ (C) $-3\det(A)$ (D) None of these

73. Which of the following functions satisfy $f(x) > 1$ for all real values of x ?
(A) $f(x) = x^2 + 2$ (B) $f(x) = 2\sin x - 2$ (C) $f(x) = x^2 - 2$ (D) $f(x) = |x + 2|$

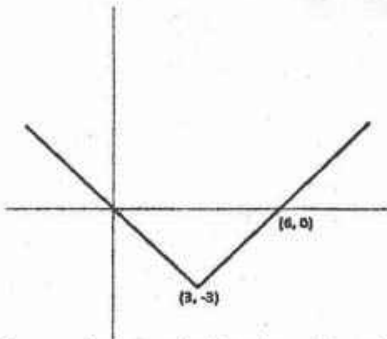
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74. Given that $f(x) = \frac{x^2 - 6x - 40}{x^2 - 16}$, then $\lim_{x \rightarrow -4} f(x) =$ _____.
 (A) ∞ (B) indeterminate (C) $\frac{7}{4}$ (D) $\frac{4}{7}$
75. An algorithm to get a good estimate of $\sqrt{2}$ is given by $x_{n+1} = \frac{2x_n^2 + 2}{2x_n}$, $n = 0, 1, 2, 3, \dots$. Starting this algorithm with $x_0 = 1$ the value of $x_3 =$ _____.
 (A) 1.414222 (B) 1.414216 (C) 1.4141 (D) None of these
76. In order that the system of equations $ax + 2y = b$, $3x - y = c$ has only one solution _____.
 (A) $a \neq 6$ (B) $a \neq -6$ (C) $a \neq b$ (D) $b \neq c$
77. Given that $4 < \left| \frac{2}{3}x - 5 \right|$ then _____.
 (A) $1.5 < x < 13.5$ (B) $1.5 \leq x < 13.5$ (C) $1.5 < x \leq 13.5$ (D) None of these



78. In the figure above the radius of the circle is 4 and square ABCD is inscribed in it. The area of the shaded region is _____.
 (A) $4\pi + 1$ (B) $4\pi - 1$ (C) $4\pi - 2$ (D) None of these
79. $\operatorname{cosec}(\tan^{-1}(\infty)) =$ _____.
 (A) 0 (B) 1 (C) ∞ (D) None of these
80. A company is replacing two cylindrical oil-storage tanks with a new tank. The old tanks are each 16 feet high. One has the radius of 15 feet and the other a radius of 20 feet. The new tank is also of the same height. If the volume of the new tank is required to be the same as the sum of the volumes of the two old tanks the radius of the new tank should be _____.
 (A) 20 feet (B) 25 feet (C) 30 feet (D) 35 feet
81. A ball thrown vertically upwards reaches a maximum height of 100 meters. In the absence of wind and any air friction it comes down vertically and bounces back to a height one fifth of the previous height attained. The distance travelled by the ball when it hits the ground for the 5th time is _____.
 (A) 240m (B) 250m (C) 249.92m (D) None of these
82. In triangular park trees are planted in rows such that the first row has 4 trees and every successive row has two more trees. If there are 15 such rows of trees the total number of trees in the park are _____.
 (A) 300 (B) 32 (C) 270 (D) None of these

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83. The graph shown in the above figure is best described by the function $f(x) =$ _____.
 (A) $|3x - 3|$ (B) $\begin{cases} x - 6 & \text{for } x \geq 3 \\ -x & \text{for } x < 3 \end{cases}$ (C) $|3x - 1|$ (D) None of these
84. Given that $f(x) = \frac{\sqrt{x}+3}{2}$, then $f^{-1}(x) =$ _____.
 (A) $x^2 - 3x + 2$ (B) $2(2x^2 - 6x + 4.5)$ (C) $(2x - 2.5)^2$ (D) $x^2 - 3x + 9$
85. The sum of the lengths of the semi minor and the semi major axis of an ellipse is five less than the their product. If their product is 12 then the equation of the ellipse is _____.
 (A) $\frac{x^2}{9} + \frac{y^2}{4} = 1$ (B) $\frac{x^2}{9} + \frac{y^2}{16} = 1$ (C) $\frac{x^2}{16} + \frac{y^2}{4} = 1$ (D) $\frac{x^2}{9} - \frac{y^2}{16} = 1$
86. The straight line perpendicular to the line $2x - 5y = 15$ is _____.
 (A) $2x + 5y = 15$ (B) $5x - 5y = 5$ (C) $5x + 2y = 2$ (D) $5x - 2y = 15$
87. The circle $(x + 1)^2 + (y - 4)^2 = 26$ intersects the y-axis at _____.
 (A) (9, 0) and (-1, 0) (B) (9, 0) and (0, -1) (C) (0, 9) and (-1, 0) (D) None of these
88. A producer of perishable products offers a wage incentive to drivers of its vehicles. A standard delivery takes an average of 30 hours. Drivers are paid at the rate of \$15 per hour up to a maximum of \$450. There is an incentive for drivers to make the deliveries in less than 30 hours (but not too much less). For each hour under 30, the hourly wage is increased by \$2 (the increase applies to fraction of an hour also). If a driver makes a delivery in 26 hour and 40 minutes what shall be his total wages?
 (A) \$400 (B) \$577.78 (C) \$453.33 (D) None of these
89. A colony of bacteria has an initial population of 1.56 million that doubles in every day. In 3 days the population should exceed _____.
 (A) 12.5 million (B) 12.4 million (C) 12.6 million (D) 20 million
90. The Airport Taxi service charges Rs 300 plus Rs 10 for every half a kilometer travelled. A passenger travelled k kilometers and had to pay Rs _____.
 (A) $300 + 10k$ (B) $300 + 5k$ (C) $300 + 20k$ (D) $300 - 20k$
91. One of the following points lies inside the region enclosed by $\frac{(x-2)^2}{4} + (y+4)^2 = 25$.
 (A) (0, 0) (B) (-1, -1) (C) (2, -3.5) (D) (3, 1)
92. If $t = \log_n(m^n)$ then $t = 0$ if _____.
 (A) $m = 1$ (B) $m = 0$ (C) $m = t$ (D) $m = n$
93. If $A = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 5 \\ 2 & 0 & 2 \end{bmatrix}$ then $A^{-1} =$ _____.
 (A) $\begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 5 \\ 0 & 0 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 1 & 1 \\ 0 & 0 & 5 \\ 0 & 0 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & 0 & 1 \\ 5 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$ (D) Does not exist

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PART II - Mathematics M.C.Q'S

94. If $p = \frac{3}{7}$, $q = \frac{1}{5}$ and $r = \frac{2}{5}$ then $14p - \frac{9r^2}{4q^2} =$ _____.

- (A) 15 (B) 3 (C) -3 (D) 9

95. Four coins are tossed at the same time. What is the probability that heads appear on at least three of them?

- (A) $\frac{2}{5}$ (B) $\frac{5}{16}$ (C) $\frac{9}{16}$ (D) $\frac{5}{8}$

Congratulation! You have just finished math MCQs.

(Stop. Do not turn this page. Wait for the invigilator's signal.)

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PART III - Specialization M.C.Q'S

Number of Questions: 40

Questions on Page Numbers: 15 To 25

Time Allowed: 50 Minutes

Negative Marking: Yes

96. CPU does not perform the operation
- data transfer
 - logic operation
 - arithmetic operation
 - all of above
97. Dynamic memory allocation occurs
- at compilation time
 - during execution of the program
 - When the previously defined 'insert' operation is executed
 - none of the above
98. When new data are to be inserted into a data structure, but there is no available space; this situation is usually called
- underflow
 - overflow
 - housefull
 - saturated
99. An _____ is a program that gathers information or performs some other service on a regular schedule without a human being's immediate presence.
- Applet
 - Agent
 - Object
 - State machine
100. The representation of the content, relationships, and constraints of the data needed to support the system requirements is the:
- data model.
 - relation design.
 - implementation.
 - data view.
101. The output of a three input (A, B, and C) AND gate is connected to a two input OR gate. A second input to the OR gate is labeled D. The Boolean expression representing this logic circuit is:
- $X = ABC + D$
 - $X = (A + B + C) + D$
 - $X = (ABC)D$
 - $X = (A + B + C) D$
102. One major difference between a queue and a stack is:
- Queues require linked lists, but stacks do not.
 - Stacks require linked lists, but queues do not.
 - Queues use two ends of the structure; stacks use only one.
 - Stacks use two ends of the structure, queues use only one.

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PART III - Specialization M.C.Q'S

103. In predicate logic, the symbols \forall and \exists are called _____.
 a. Tautology
 b. Contradiction
 c. Quantifiers
 d. Deduction
104. A variable P is called pointer if
 a. P contains the address of an element in DATA.
 b. P points to the address of first element in DATA
 c. P can store only memory addresses
 d. P contain the DATA and the address of DATA
105. Consider the set of relations shown below and the SQL query that follows:
 Students: (Roll _ number, Name, Date _ of _ birth)
 Courses: (Course _ number, Course _ name, Instructor)
 Grades: (Roll _ number, Course _ number, Grade)

 Select distinct Name
 from Students, Courses, Grades
 where Students.Roll _ number = Grades.Roll _ number
 and Courses.Instructor = Korth
 and Courses.Course _ number = Grades.Course _ number
 and Grades.grade = A

 Which of the following sets is computed by the above query?
 a. Names of students who have got an A grade in all courses taught by Korth
 b. Names of students who have got an A grade in all courses
 c. Name of students who have got an A grade in at least one of the courses taught by Korth
 d. None of the above
106. A processor needs software interrupt to:
 a. test the interrupt system of the processor
 b. implement co-routines
 c. obtain system services which need execution of privileged instructions
 d. return from subroutine
107. Write the following statement in first-order predicate logic: "Everyone likes cheese".
 a. Likes(everyone, cheese)
 b. Everyone \rightarrow Likes(Cheese)
 c. $(\forall x) (Person(x) \rightarrow Likes(x, Cheese))$
 d. Everyone \rightarrow Cheese(Likes)
108. The situation where the processor spends most of its time swapping process pieces rather than executing instructions is called:
 a. Paging
 b. Thrashing
 c. The Principle of Locality d. None of the above

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109. The Boolean expression $X = \overline{A + B + C}$ is logically equivalent to what single gate?
- NOR gate
 - NAND gate
 - AND gate
 - OR gate
110. When different sets of data are appearing on the same output line at different times, the data is:
- Frequency-shifted multiplexed.
 - Frequency-shifted demultiplexed.
 - Time-division multiplexed.
 - Time-division demultiplexed.
111. Which of the following data structures are indexed structures?
- linear arrays
 - linked lists
 - both of above
 - none of above
112. The real address of a word in memory is translated from the following portions of a virtual address:
- Page number and offset
 - Page number and frame number
 - Frame number and offset
 - None of the above
113. Which of the following data structure can't store the non-homogeneous data elements?
- Arrays
 - Records
 - Pointers
 - None
114. A computer program that converts an entire program into machine language at one time is called a/an
- interpreter
 - simulator
 - compiler
 - commander
115. Which normal form was developed in order to eliminate multivalued dependencies?
- BCNF
 - 4NF
 - 5NF
 - 3NF

116. What will be the output of the following code:

```
int main(){
    int a=4,b=5;
    printf(a, b);
}
printit(int b, int a){
    printf("%d %d", a, b);
}
int a=0;
    int b=1;
    printf("%d %d", a, b);
}
return 0;
```

- A. 4 5 0 1
B. 5 4 0 1
C. 5 4 5 4
D. None of these

117. What will be the output of the following code:

```
int main(){
    int arr[][3]={1,2},{3,4,5},{5}};
    printf("%d %d %d",sizeof(arr),arr[0][2],arr[1][2]);
    return 0;
}
```

- A. 6 0 4
B. 6 1 5
C. 18 0 5
D. 18 1 5

118. In Object Oriented Programming style, which of the following relationship is known as inheritance relationship?

- A. 'has-a' relationship
B. 'is-a' relationship
C. association relationship
D. modification relationship

119. What is the output of the following program:

```
public class ParamTest
{
    public static void foo (int x, double y)
    {
        x = 3;
        y = 2.5;
    }
}
```

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```
public static void main(String[], args)
{
    int a=7;
    double b = 6.5;
    foo(a, b)
    System.out.println(a + " , " + b);
}
}
```

- A. 3, 2.5
- B. 2.5, 3
- C. 6, 7.5
- D. 7, 6.5

120. A recursive function would result in infinite recursion, if the following were left out:

- A. Base case
- B. Recursive call
- C. Subtraction
- D. Local variable declarations

121. What is the output of this program segment:

```
ArrayList names = new ArrayList();
names.add("Arif");
names.add("Kashif");
names.add("Shamim");
names.add("Lubna");
names.set(2,"Nida");
System.out.println();
for (int k = 0; k < names.size(); k++)

    System.out.print(names.get(k) + " ");
```

- A. Arif Kashif Nida Lubna
- B. Arif Nida Shamim Lubna
- C. Arif Nida Kashif Shamim Lubna
- D. Arif Kashif Nida Shamim Lubna

122. What printed by the following program segment?

```
String s1 = "Racecar";
String s2 = "car";
System.out.println(s1.substring(0,3) + s2.substring(0));
```

- A. Raccar
- B. Racc
- C. Racecar
- D. Raceca

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123. What is printed by executing the following code segments:

```
class Person
{
    public Person()
    {
        System.out.println("Constructing Person object");
    }
}

class Student extends Person
{
    public Student()
    {
        System.out.println("Constructing Student object");
    }
}

Student tom = new Student();
```

- A. Constructing Student object
 B. Constructing Person object
 C. Constructing Person object
 Constructing Student object
 D. Constructing Student object
 Constructing Person object
124. Consider the following table of integers:

```
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
```

Among the following, which array would store the table with the minimum amount of memory used?

- A. `int[] [] a = new int[5][6];`
 B. `int[] [] a = new int[5][];`
`for(int i=0; i<a.length; i++) a[i] = new int[i];`
 C. `int[] [] a = new int[5][];`
`for(int i=0; i<a.length; i++) a[i] = new int[i+1];`
 D. `int[] [] a = new int[5][];`
`for(int i=0; i<a.length; i++) a[i] = new int[i+2];`

125. Consider the following code fragment

```
public int mystery(int a, int b)
{
    if (b==1)
        return a;
    else
        return a + mystery(a,b-1);
}
```

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What is the value of `mystery (2, 3)` ?

- A. 2
- B. 4
- C. 6
- D. 8

126. If the instance variables of the `Employee` class are declared as follows, which of the following statements is most likely to be in the constructor of this class?

```
private String name;
private Address address;
private long employeeNumber;
```

- A. `address = 0;`
- B. `address = "";`
- C. `address = new Address();`
- D. `employeeNumber = "11233444";`

127. What will be the output by the following code fragment?

```
int a = 3;
int b = 6;
int c = 10;
System.out.println("Average = " + a + b + c / 3);
```

- A. `Average = 3610/3`
- B. `Average = 363`
- C. `Average = 6`
- D. `Average = 6.333333`

128. Consider the following method:

```
// precondition: n > 0
public int doSomething(int n)
{
    int x = 0;
    for (int a = 0; a < n; a++)
    {
        for (int b = 0; b < n; b++)
        {
            x++;
        }
    }
    return x;
}
```

Which of the following is execution equivalent to the body of `doSomething(n)`?

- A. `return 2*n;`
- B. `return n*(n-1);`
- C. `return n2;`
- D. `return n*(n+1);`

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129.

What will be the output of the following program?

```

public class Mystery
{
    public static void strangeMethod (int x, int y)
    {
        x += y;
        y *= x;
        System.out.println( x + " " + y);
    }

    public static void main (String [] args)
    {
        int a = 6, b=3;
        strangeMethod (a,b);
        System.out.println(a + " " + b);
    }
}

```

- A. 36
9
- B. 3 6
9
- C. 9 27
9 27
- D. 9 27
6 3

130.

If the input value for n is 3, what screen output will this program subsequently produce?

```

public class CountStuff
{
    public static void doSomething()
    {
        int count = 0;
        // some code for internal structures of doSomething
        //
        count ++;
    }

    public static void main(String[] args)
    {
        int count = 0;
        System.out.println("How many iterations?");
        int n = IO.readInt(); // read user input
        for (int i = 1; i <= n; i++)
        {
            doSomething();
            System.out.println(count);
        }
    }
}

```

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A. 0
0
0

B. 1
2
3

C. 3
3
3

D. 0
1
2

131. Consider that the methods f1 and f2 are in the same class:

```
public static int f1(int a, int b)
{
    if ( a == b)
        return b;
    else
        return a + f2(a-1, b);
}

public static int f2 (int p, int q)
{
    If ( p < q)
        return p+q;
    Else
        return p + f1(p-2, q);
}
```

What value will be returned by a call to f1(5,3)?

A. 5
B. 6
C. 7
D. 15

132. Consider the method f1:

```
public int f1(int y)
{
    if (y == 1 || y == 3)
        return y;
    else
        return y*f1(y-1);
}
```

Assuming no possibility of integer overflow, what will be the value of z after execution of following statement?

```
int z = f1(f1(3) + f1(4))
```


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- A. $(15!)/(2!)$
- B. $3! + 4!$
- C. $(7!)$
- D. $(3! + 4!)!$

133. What is the answer of evaluating the following expression:

`!(1 && !(0 || 1))`

- A. True
- B. False
- C. System Error
- D. !1

134. Consider the following method. Assume that p1 is not empty, square array of integers.

```
public static boolean check (int[] [] p1)
{
    for (int c = 0; c < p1[0].length; c++)
    {
        for (int r = 0; r < p1.length; r++)
            if (p1[r][c] != p1[c][r])
                return false;
    }
    return true;
}
```

Under what circumstances will the variable check return true?

- A. Only the elements on the two diagonals are equal.
- B. The main diagonal splits the array into two halves that are mirror images of each other.
- C. The secondary diagonal splits the array into two halves that are mirror images of each other.
- D. The left half of the array is a mirror image of the right half of the array.

135. Consider the following code:

```
public class Pet
{
    public Pet()
    {
    }
    public void animal()
    {
        System.out.println("Some Animals");
    }
    public void story()
    {
        System.out.println("are good pets");
    }

    public void sentence()
    {
        animal();
        story();
    }
}
```

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```
public class Cat extends Pet
{
    public Cat()
    {}
    public void animal()
    {
        System.out.println("cats ");
    }
}
```

What is printed as a result of executing the following code:

```
Cat xx = new Cat();
xx.sentence();
```

- A. some animals are good pets.
- B. some animals cats some animals are good pets.
- C. some animals cats some animals.
- D. some animals cats cats.

Congratulation! You have just finished specialization MCQs.

Please cross (X) Option E in the answer sheet corresponding to all
unanswered MCQs.