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CAT 2009 VARC

DIRECTIONS (Qs. 1 to 10): Read the following passages-I, II and III and give answer based on it.

History has shaped academic medical centers (AMCs) to perform 3 functions: patient care, research, and teaching. These 3 missions are now fraught with problems because the attempt to combine them has led to such inefficiencies as duplication of activities and personnel, inpatient procedures that could and should have been out-patient procedures, and unwieldy administrative bureaucracies. One source of inefficiency derives from mixed lines of authority. Clinical chiefs and practitioners in AMCs are typically responsible to the hospital for practice issues but to the medical school for promotion, marketing, membership in a faculty practice plan, and educational accreditation. Community physicians with privileges at a university hospital add more complications. They have no official affiliation with the AMC's medical school connected, but their cooperation with faculty members is essential for proper patient treatment. The fragmented accountability is heightened by the fact that 3 different groups often vie for the loyalty of physicians who receive research. The medical school may wish to capitalize on the research for its educational value to students; the hospital may desire the stateof-the-art treatment methods resulting from the research; and the grant administrators may, focus on the researchers' humanitarian motives. Communication among these groups is rarely coordinated, and the physicians may serve whichever group promises the best perks and ignore the rest -which inevitably strains relationships.

Another source of inefficiency is the fact that physicians have obligations to many different groups: patients, students, faculty members, referring physicians, third-party payers, and staff members, all of whom have varied expectations. Satisfying the interests of one group may alienate others. Patient care provides a common example. For the benefit of medical students, physicians may order too many tests, prolong patient visits, or encourage experimental studies of a patient. If AMC faculty physicians were more aware of how much treatments of specific illnesses cost, and of how other institutions treat patient conditions, they would be better practitioners, and the educational and clinical care missions of AMCs would both be better served.

A bias toward specialization adds yet more inefficiency. AMCs are viewed as institutions serving the gravest cases in need of the most advanced treatments. The high number of specialty residents and the presence of burn units, blood banks, and transplant centers validate this belief. Also present at AMCs, though less conspicuous, are facilities for ordinary primary care patients. In fact, many patients choose to visit an AMC for primary care because they realize that any necessary follow-up can occur almost instantaneously. While AMCs have emphasized cutting-edge specialty medicine, their more routine medical services need development and enhancement.

A final contribution to inefficiency is organizational complacency. Until recently, most academic medical centers drew the public merely by existing. The rising presence, however, of tertiary hospitals with patient care as their only goal has immersed AMCs in a very competitive market. It is only in the past several years that AMCs have started to recognize and develop strategies to address competition.

The author's attitude toward the inefficiencies at academic medical centers is one of

 (a) reluctant acquiescence
 (b) strident opposition

(c) agonized indecision (d) reasoned criticism

- 2. The author of the passage would most likely agree with which of the following statements about primary care at AMCs?
 - (a) AMCs would make more money if they focused mainly on primary care.
 - (b) Burn and transplant patients need specialty care more than primary care.
 - (c) AMCs offer the best primary care for most patients.
 - (d) Inefficiencies at AMCs would be reduced if better primary care were offered.
- 3. The author's primary purpose in this passage is to
 - (a) discuss the rise and fall of academic medical centers
 - (b) explain that multiple lines of authority in a medical centre create inefficiencies
 - (c) delineate conflicts occurring in academic medical facilities
 - (d) examine the differences between academic and other health care entities
- 4. The author implies which of the following about faculty physicians at AMCS?(a) Most of them lack good business sense.
 - (b) They put patients' physical health above their hospitals' monetary concerns.
 - (c) They sometimes focus on education at the expense of patient care.
 - (d) They lack official affiliation with the medical schools connected to AMCS.

Founded at the dawn of the modern industrial era, the nearly forgotten Women's Trade Union League (WTUL) played an instrumental Line role in advancing the cause of working women throughout the early part of the twentieth century. In the face of considerable adversity, the WTUL made a contribution far greater than did most historical footnotes.

The organization's successes did not come easily; conflict beset the WTUL in many forms.

During those early days of American unions, organized labour was aggressively opposed by both industry and government. The WTUL, which represented a largely unskilled labour force, had little leverage against these powerful opponents. Also, because of the skill level of its workers as well as inherent societal gender bias, the WTUL had great difficulty finding allies among other unions. Even the large and powerful American Federation of Labour (AFL), which nominally took the WTUL under its wing, kept it at a distance. Because the AFL'S power stemmed from its highly skilled labour force, the organization saw little economic benefit in working with the WTUL. The affiliation provided the AFL with political cover, allowing it to claim support for women workers; in return, the WTUL gained a potent but largely absent ally.

The WTUL also had to overcome internal discord. While the majority of the group's members were working women, a sizeable and powerful minority consisted of middle- and upper class social reformers whose goals extended beyond labour reform. While workers argued that the

WTUL should focus its efforts on collective bargaining and working conditions, the reformers looked beyond the workplace, seeking state and national legislation aimed at education reform and urban poverty relief as well as workplace issues.

Despite these obstacles, the WTUL accomplished a great deal. The organization was instrumental in the passage of state laws mandating an eight-hour workday, a minimum wage for women, and a ban on child labour. It provided seed money to women who organized workers in specific plants and industries, and also established strike funds and soup kitchens to support striking unionists. After the tragic Triangle Shirtwaist Company fire of 1911, the WTUL launched a four-year investigation whose conclusions formed the basis of much subsequent workplace safety legislation. The organization also offered a political base for all reform-minded women, and thus helped develop the next generation of American leaders. Eleanor Roosevelt was one of many prominent figures to emerge from the WTUL.

The organization began a slow death in the late 1920s, when the Great Depression choked off its funding. The organization limped through the 1940s; the death knell eventually rang in 1950, at the onset of the McCarthy era. A turn of-the-century labour organization dedicated to social reform, one that during its heyday was regarded by many as "radical," stood little chance of weathering that storm. This humble ending, however, does nothing to diminish the accomplishments of an organization that is yet to receive its historical due.

5. The primary purpose of this passage is to

- (a) describe the barriers confronting women in the contemporary workplace
- (b) call readers' attention to an overlooked contributor to American history
- (c) critique the methods employed by an important labour union
- (d) rebuke historians for failing to cover the women's labour movement adequately
- 6. Which of the following best characterizes the American Federation of Labour's view of the Women's Trade Union League, as it is presented in the passage?

(a) The WTUL was an important component of the AFLs multifront assault on industry and its treatment of workers.

(b) Because of Eleanor Roosevelt's affiliation with the organization. the WTUL was a vehicle through which the AFL could gain access to the White House.

(c) The WTUL was to be avoided because the radical element within it attracted unwanted government scrutiny.

(d) The WTUL offered the AFL some political capital but little that would assist it in labour negotiations.

7. Each of the following is cited in the passage as an accomplishment of the Women's Trade Union League EXCEPT

(a) It organized a highly skilled workforce to increase its bargaining power.

- (b) It contributed to the development of a group of leaders in America.
- (c) It provided essential support to striking women.
- (d) It helped fund start-up unions for women.

The function of strategic planning is to position a company for long-term growth and expansion in a variety of markets by analyzing its strengths and weaknesses and examining current and potential opportunities. Based on this information, the company develops strategy for itself. That strategy then becomes the basis for supporting strategies for its various departments.

This is where all too many strategic plans go astray-at implementation. Recent business management surveys show that most CEOs who have a strategic plan are concerned with the potential breakdown in the implementation of the plan. Unlike 1980s corporations that blindly followed their 5-year plans, even when they were misguided, today's corporations tend to second-guess.

Outsiders can help facilitate the process, but in the final analysis, if the company doesn't make the plan, the company won't follow the plan. This was one of the problems with strategic planning in the 1980s. In that era, it was an abstract, top-down process involving only a few top corporate officers and hired guns. Number crunching experts came into a company and generated tome-like volumes filled with a mixture of abstruse facts and grand theories which had little to do with the day-to-day realities of the company. Key middle managers were left out of planning sessions, resulting in lost opportunities and ruffled feelings.

However, more hands-on strategic planning can produce startling results. A recent survey queried more than a thousand small-to-medium sized businesses to compare companies with a strategic plan to companies without one. The survey found that companies with strategic plans had annual revenue growth of 6.2 percent as opposed to 3.8 percent for the other companies.

Perhaps most important, a strategic plan helps companies anticipate-and survive-change. New technology and the mobility of capital mean that markets can shift faster than ever before. Some financial analysts wonder why they should bother planning two years ahead when market dynamics might be transformed by next quarter. The fact is that it's the very pace of change that makes planning so crucial. Now, more than ever, companies have to stay alert to the marketplace. In an environment of continual and rapid change, long range planning expands options and organizational flexibility.

8. The primary-purpose of the passage is to

(a) refute the idea that change is bad for a corporation's long-term health

(b) describe how long-term planning, despite some potential pitfalls, can help a corporation to grow

(c) compare and contrast two styles of corporate planning

(d) evaluate the strategic planning goals of corporate America today

9. It can be inferred from the passage that, in general, strategic planning during the 1980s had all of the following shortcomings EXCEPT

(a) a reliance on outside consultants who did not necessarily understand the nuts and bolts of the business

(b) a dependence on theoretical models that did not always perfectly describe the workings of the company

(c) an inherent weakness in the company's own ability to implement the strategic plan.

(d) an excess of information and data that made it difficult to get to key concepts.

10. The author most likely mentions the results of the survey of 1,000 companies in order to

(a) put forth an opposing view on strategic plans so that she can then refute it

(b) illustrate that when strategic planning is "hands-on," it produces uninspiring results

(c) give a concrete example as why strategic planning did not work during the 1980s

(d) support her contention that strategic planning when done correctly can be very successful

11. Over the last 20 years the rate of increase in total production in Workland has been second to none in the world. However, the growth is more modest when calculated per capita of total population. Over the last ten years progress has been much slower.

If the information above is accurate, which of the following must be true?

(a) Workland has a very large population.

(b) Productivity per capita has not grown as fast during the past ten years.

(c) Total production has increased faster than population growth..

(d) The birth rate has declined.

12. Between 1979 and 1983, the number of unincorporated business self-employed women increased five times faster than the number of self employed men and more than three times faster than women wage-and-salary workers. Part-time self-employment among women increased more than full-time self-employment.

Each of the following, if true, could help to account for this trend except:

(a) Owning a business affords flexibility to combine work and family responsibilities.

(b) The proportion of women studying business administration courses has grown considerable.

(c) There are more self-employed women than men.

(d) Unincorporated service industries have grown by 300 percent over the period; the ratio of women to men in this industry.

13. There is no clear line between health and illness; it is easy to forget what it feels like to be really well and to get gradually used to often having a headache, feeling irritable, or tired. There is an unrecognized proportion of the population that has been tipped over the brink into ill health by ubiquitous contaminants.

Which of the following statements best describes the purpose of the above?

(a) The public must be encouraged to have regular medical examinations.

(b) The public must be warned to be aware of various physical and chemical hazards.

(c) The public must be warned to treat seriously such symptoms as headaches, irritability, and tiredness.

(d) The medical professional is not always capable of diagnosing illness.

DIRECTIONS (Qs. 14-15): In each question, there are five sentences. Each sentence has a pair of words that are italicized and highlighted. From the italicized and highlighted words, select the most appropriate words (A or B) to form correct sentences. The sentences are followed by options that indicate the words, which may be selected to correctly complete the set of sentences. From the options given, choose the most appropriate one.

14. The further [A]/farther [B] he pushed himself, the more disillusioned he grew.

For the crowds it was more of a **historical** [A]/**historic** [B] event; for their leader, it was just another day.

The old man has a healthy **distrust** [A] / **mistrust** [B] for all new technology. This film is based on a real [A]/ true [B] story.

One suspects that the **compliment** [A]/**complement** [B] was backhanded. (a) BABAB (b) ABABA (c) BAABA (d) BBAAB

15. Regrettably [A]/Regretfully [B] I have to decline your invitation.

I am drawn to the poetic, **sensual** [A]/**sensuous** [B] quality of her paintings. He was besides [A]/ beside [B] himself with age when I told him what I had done.

After brushing against a stationary [A]/stationery [B] truck my car turned turtle.

As the water began to rise **over** [A] / **above** [B] the danger mark, the signs of an imminent flood were clear.

(a) BAABA (b) BBBAB (c) AAABA (d) BBAAB

DIRECTIONS (Qs. 16-17): In each question, the word at the top is used in four different ways, numbered (a) to (d). Choose the option in which the usage of the word is Incorrect or Inappropriate.

16. SORT

(a) Let's sort these boys into four groups

(b) They serve tea of a sort on these trains.

(c) Farmers of all sort attended the rally.

(d) What sort of cheese do you use in pizza?

17. HOST

- (a) A virus has infected the host computer
- (b) Ranchi will play the host to the next national film festival
- (c) Kerala's forests are host to a range of snakes
- (d) If you host the party, who will foot the bill

18. Select the one which would best fill the blanks.

Football evokes a _____ response in India compared to cricket, the almost _____ the nation

(a) tepid, boiling

(b) lukewarm, electrifies

(c) turbid, fascinating

(d) apocryphal, genuinely fascinates

DIRECTIONS (Qs. 19-20): Each question consists of four sentences on a topic. Some sentences are grammatically incorrect or inappropriate. Select the option that indicates the grammatically correct and appropriate sentence(s).

19. A. Last Sunday, Archana had nothing to do.

B. After waking up, she lay on the bed thinking of what to do.

C. At 11 o'clock she took shower and got ready.

D. She spent most of the day shopping.

(a) Band C

(b) C

(c) A and B

(d) B, Cand D

20. A. Large reductions in the ozone layer, which sits about 15-30 km above the Earth, take place each winter over the polar regions, especially the Antarctic, as low temperatures allow the formation of stratospheric clouds that assist chemical reactions breaking down ozone. B. Industrial chemicals containing chlorine and bromine have-been blamed for thinning the

layer because they attack the ozone molecules, making them to break apart.

C. Many an offending chemicals have now been banned.

D. It will still take several decades before these substances have disappeared from the atmosphere.

(a) D

(b) B&D

(c) A&D

(d) A&C





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DIRECTIONS (Qs. 1-5): These are based on the following Line Chart: The sales and net profit of XPL Electronics in Rs. crores is given below.



Note: Net profit Gross Profit-Tax. Gross profit-Sales-Expenses. The figures for sales is given at the bottom of the bar chart and the figures for net profit is given on top of the line chart.

- 1. What is the net profit percentage of XPL in 1998? (a) 4.6% (b) 4.8% (c) 5.1% (d) 6.2%
- Which year showed the maximum percentage increase in sales?
 (a) 1999
 (b) 1998
 (c) 1997
 (d) 1996
- By how much percentage has the net profit dropped in 1996?
 (a) 1.1%
 (b) 2.27%
 (c) 2.53%
 (d) Cannot be determined
- 4. If XPL sold 20,000 units in both 1998 and 1999, by what percentage has the price per unit changed?
 (a) 8.7%
 (b) 10.96%
 (c) 9.86%
 (d) Cannot be determined
- 5. The year in which the expenses of XPL Electronic are highest is (a) 1999 (b) 1998 (c) 1997 (d) Cannot be determined

Direction (Qs 6 - 10) : Study the following pie chart carefully and answer the questions given beside.

The following pie chart gives the information about the percentage distribution of central government employees by age profile.



- 6. Out of 2.68 lakhs central government employees, how many are above 60 years old? (224.26 th)
 - (a) 34.26 thousand
 - (b) 38.96 thousand
 - (c) 3.216 lakhs
 - (d) 32.16 thousand
 - (e) None of these
- 7. Out of 6.8 lakhs seats, only 4.2 lakhs are employed. If the government plans to fill all the empty seats by giving 20% reservation for ex-servicemen of the age profile of 30 49 years and remaining seats are filled by freshers of the age profile of 20 29 years then total how many freshers will be hired by the government?
 - (a) 2.08 lakhs
 - (b) 2.18 lakhs
 - (c) 0.52 lakhs
 - (d) 1.06 lakhs
 - (e) None of these
- 8. 2.6 lakhs candidate were to be selected out of the 18.6 lakhs candidates who had applied for government job. Out of the applied candidates 20% of them were ex-servicemen and the number of seats reserved for them was 20%, then approximately what percentage of the number of ex-servicemen applicants will be selected ?
 - (a) 12%
 - (b) 14%
 - (c) 17%
 - (d) 19%
 - (e) 10%

- 9. The number of central government employees of age profile of 50 years or greater than 50 years is how much percentage more than that of 20 29 years?
 - (a) 300%
 - (b) 350%
 - (c) 200%
 - (d) 250%
 - (e) None of these
- 10. By what percent the number of central government employees of age profile of 40 49 years is less than that of 30 39 years?
 - (a) 42.34%
 - (b) 55.12%
 - (c) 61.42%
 - (d) 57.14%
 - (e) 52.28%

DIRECTIONS (QS. 11 to 15): Read the following information and answer the questions that follow:

The cars at a dealership come with a choice of the following options: air-conditioning, a cassette deck, leather seats, power windows, sunroof and tinted glass. None of the cars has any other optional equipment. The following conditions apply:

If a car has leather seats, it also has a cassette deck. If a car has a cassette deck, it also has power windows; If a car has power windows, it also has a cassette deck.

Cars with tinted glass have a sunroof, but no air-conditioning. Cars that have air-conditioning have, at most, two other options.

- 11. If a car has both tinted glass and leather seats, what is the greatest number of additional options that the car could have?(a) 1 (b) 2 (c) 3 (d) 4
- 12. Which one of the following could be a complete and accurate list of options on a car? (a) air-conditioning, cassette deck, leather seats, power windows
 - (a) all-conditioning, cassette deek, leather seats, power windo
 - (b) air-conditioning, cassette deck, leather seats, sunroof
 - (c) cassette deck, leather seats, sunroof, tinted glass
 - (d) cassette deck, power windows, sunroof, tinted glass
- 13. If a car has power windows and a sunroof, how many different sets of options, at most, can the car have?
 - (a) 2 (b) 3 (c) 4 (d) 5
- 14. If a car has exactly two options, which one of the following could they be?

(a) air-conditioning and cassette deck

- (b) tinted glass and sunroof
- (c) cassette deck and leather seats
- (d) power windows and sunroof

15. If a car has tinted glass, which one of the following CANNOT be true?

- (a) The car has 3 options.
- (b) The car has 4 options.
- (c) The car has power windows and a sunroof.
- (d) The car does not have both leather seats and a cassette deck.

DIRECTIONS (Q. 16 to 20): Each of the following problems consists of a question and the statements labelled (1) and (2). You must decide whether the data given la the statements are sufficient to answers the question.

16. If both ABDC and CDFE are parallelograms. what is q + r?



(a) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.

(b) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.

(c) BOTH statements TOGETHER are sufficient, but NEITHER statement alone is sufficient.

(d) EACH statement ALONE is sufficient.

17. A certain stadium is currently full to $\frac{13}{16}$ of its maximum seating capacity. What is the maximum seating capacity of the stadium?

(1) If 1,250 people were to enter the stadium, the stadium would be full to $\frac{15}{16}$ of its maximum seating capacity.

(2) If 2,500 people were to leave the stadium, the stadium would be full to $\frac{9}{16}$ of its maximum seating capacity.

(a) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.

(b) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.

(c) BOTH statements TOGETHER are sufficient, but NEITHER statement alone is sufficient.

(d) EACH statement ALONE is sufficient.

- 18. If n is an integer, is n even?
 - (1) 2n is an even integer.
 - (2) -1 is an odd integer.
 - (a) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
 - (b) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.

(c) BOTH statements TOGETHER are sufficient, but NEITHER statement alone is sufficient.

- (d) EACH statement ALONE is sufficient.
- 19. What is the value of x?
 - (1) $x^2-5x+4-0$
 - (2) x is not prime.
 - (a) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
 - (b) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.

(c) BOTH statements TOGETHER are sufficient, but NEITHER statement alone is sufficient.

- (d) Statements (1) and (2) TOGETHER are NOT sufficient.
- 20. A fish tank contains a number of fish, including 5 Fantails. If two fish are selected from the tank at random, what is the probability that both will be Fantails?

(1) The probability that the first fish chosen will be a Fantail is $\frac{1}{2}$

(2) The probability that the second fish chosen will be a Fantail is $\frac{4}{2}$

- (a) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
- (b) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.

(c) BOTH statements TOGETHER are sufficient, but NEITHER statement alone is sufficient.

(d) EACH statement ALONE is sufficient.



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CAT 2009 Quant (Memory Based Paper)

1.	If $mx^m - nx^n = 0$, then what is the value of $\frac{1}{x^m + x^n} + \frac{1}{x^m - x^n}$ in terms of x^n ?							
	(a) $\frac{2mn}{x^n (n^2 - m^2)}$ (b) $\frac{2mn}{x^n (n^2 + m^2)}$	(c) $\frac{2mn}{x^n(m^2-n^2)}$	(d) $\frac{2mn}{x^n(m^2+n^2)}$					
2.	If $\log (0.57) = \overline{1.756}$, then the value of $\log 57 + \log (0.57)^3 + \log \sqrt{0.57}$ is:							
	(a) 0.902 (b) 2.146	(c) 1.902	(d) 1.146					

3. In a certain zoo, there are 42 animals in one sector, 34 in the second sector and 20 in the third sector. Out of this, 24 graze in sector one and also in sector two. 10 graze in sector two and sector three, 12 graze in sector one and sector three. These figures also include four animals grazing in all the three sectors are now transported to another zoo, find the total number of animals.

(d) None of the above

(a) 38

The ratio of the roots of $bx^2 + nx + n = 0$ is p:q, then

(b) 56

(a)
$$\sqrt{\frac{q}{p}} + \sqrt{\frac{p}{q}} + \sqrt{\frac{\ell}{n}} = 0$$
 (b) $\sqrt{\frac{p}{q}} + \sqrt{\frac{q}{p}} + \sqrt{\frac{n}{\ell}} = 0$ (c) $\sqrt{\frac{q}{p}} + \sqrt{\frac{p}{q}} + \sqrt{\frac{\ell}{n}} = 0$ (d) $\sqrt{\frac{p}{q}} + \sqrt{\frac{q}{p}} + \sqrt{\frac{n}{\ell}} = 0$

(c) 54

- 5. The average age of a couple is 25 years. The average age of the family just after the birth of the first child was 18 years. The average age of the family just after the second child was born was 15 years. The average age of the family after the third and the fourth children (who are twins) were born was 12 years. If the present average age of the family of six persons is 16 years, how old is the eldest child ? (a) 6 years (b) 7 years (c) 8 years (d) 9 years
- 6. 10% of the voters did not cast their vote in an election between two candidates. 10% of the votes polled were found invalid. The successful candidate got 54% of the valid votes and won by a majority of 1620 votes. The number of voters enrolled on the voters list was:
 (a) 25000 (b) 33000 (c) 35000 (d) 40000
- 7. The resistance of a wire is proportional to its length and inversely proportional to the material have the same resistance and their radii are in the ratio 9: 8. If the length of the square of its radius. Two wires of the same first wire is 162 cms., find the length of the other.

(a) 64 cm. (b) 120 cm. (c) 128 cm. (d) 132-cm

1

8. A 20 litre vessel is filled with alcohol. Some of the alcohol is poured out into another vessel of an equal capacity, which is then completely filled by adding water. The mixture thus obtained is then poured into the first vessel to capacity. Then $6\frac{2}{3}$ litres is poured from the first vessel into the second. Both vessels now contain an equal amount of alcohol. How much alcohol was originally poured from the first vessel into the second? (a) 9 litres (b) 10 litres (c) 12 litres (d) 12.5 litres

9. The shaded portion of figure shows the graph of which of the following ? (1,2)

- 11. A person closes his account in an investment scheme by withdrawing Rs. 10,000. One year ago he had withdrawn Rs. 6000. Two years ago he had withdrawn Rs. 5000, Three years ago he had not withdrawn any money. How much money had he deposited approximately at the time of opening the account 4 years ago, if the annual simple interest is 10%? (c) Rs. 17280 (a) Rs. 15600 (b) Rs. 16500 (d) None of these
- 12. It takes 6 technicians a total of 10 hours to build a new server from direct computer, with each working at the same rate. If six technicians start to build the server at 11:00 am, and one technician per hour is added beginning at 5:00 pm, at what time will the server be completed?

(a) 6:40 pm (b) 7:00 pm (c) 7:20 pm (d) 8:00pm

- 13. A ship 55 kms. from the shore springs a leak which admits 2 tones of water in 6 min; 80 tones would suffer to sink her, but the pumps can throw out 12 tones an hour. Find the average rate of sailing that she may just reach the shore as she begins to sink. (a) 5.5 km/h (b) 6.5 km/h (c) 7.5 km/h (d) 8.5 km/h
- 14. In a 400 meter race around a circular stadium having a circumference of 1000 meters, the fastest runner and the slowest runner reach the same point at the end of the 5th minute, for the first time after the start of the race. All the runners have the same starting point and each runner maintains a uniform speed throughout the race. If the fastest runner runs at twice the speed of the slowest runner, what is the time taken by the fastest runner to finish the race?
 - (a) 20 mins (b) 15 mins (c) 10 mins (d) 5 mins
- 15. A train crosses a platform 100 metres long in 60 seconds at a speed of 45 km per hour. The time taken by the train to cross an electric pole, is (d) Data inadequate
 - (a) 8 seconds (b) 1 minute (c) 52 seconds

16.

If $x = 1 + 2a + 3a^2 + 4a^2 + \dots (-1 < a < 1)$ and $y = 1 + 3b + 6b^2 + 10b^3 + \dots (-1 < b < 1),$

then find $1 + ab + (ab)^2 + (ab)^3 + \dots$ in terms of x and y.

- (a) $\frac{x^{1/2}y^{1/3}}{x^{1/2}+y^{1/3}-1}$ (b) $\frac{xy}{x+y-1}$ (c) $\frac{x^{1/3}y^{2/3}}{x^{1/3}+y^{1/2}-1}$ (d) None of these
- 17. Two vertical lamp-posts of equal height stand on either side of a road 50m wide. At a point P on the road between them, the elevation of the tops of the lamp-posts are 60° and 30° . Find the distance of P from the lamp post which makes angle of 60° (a) 25m (b) 12.5 m (c) 16.5m (d) 20.5 m

3



20. A and B throw with one dice for a stake of Rs. 11 which is to be won by the player who first throws 6. If A has the first throw, what are their respective expectations
(a) Rs 7, Rs 4
(b) Rs 6, Rs 5
(c). Rs 4, Rs 7
(d) Rs5, Rs 6







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Solutions

QUANT

- 1. Correct answer : A m.xm = n.x^n x^m = n.x^n/m1 Squaring both sides, $x^2m = n^2.x^2n/m^2$ 2 Now, $1/(x^m + x^n) + 1/(x^m - x^n) = 2.x^m/(x^2m - x^2n)$ Substituting values of x^m and x²m in above eqn from eqns 1 and 2, we get $2.x^m/(x^2m - x^2n) = 2mn/xn(n^2 - m^2)$
- 2. Correct answer : A log(0.57) = -1.756Mantissa = 0.756 Characteristic = -1 log 57/100 = log 57 - log 100 = log 57 - 2 = -1.756 log 57 = 2 - 1.756there won't be any change in mantissa, characteristic will change So, log 57 = (2-1) + 0.756 = 1.756Simplifying what we have to find = log 57 + 3 $log 57/100 + \frac{1}{2}$ log 57/100 = log 57 + 3 log 57 - 3 $log 102 + \frac{1}{2}$ $log 57 - \frac{1}{2} log 102 = 9/2 log 57 - 7 = 0.902$
- 3. Correct answer : C
 - I = 42 II = 34 III = 20 $I \cap III = 24$ $II \cap III = 10$ $I \cap III = 12$ $I \cap III = 12$ $I \cap II \cap III = 4$ $I \cup II \cup III = I + II + III (I \cap II) (II \cap III) (I \cap III) + (I \cap II \cap III)$ $I \cup II \cup III = 42 + 34 + 20 24 10 12 + 4 = 54$
- 4. Correct answer : B/D Correction: The eqn is $lx^2 + nx + n = 0$ Let the roots be pa, qa pa + qa = -n/l p + q = -n/la Product of roots = a2pq = n/l pq = n/a2l p + q = - a.pq divide both sides by \sqrt{pq}

 $\frac{\sqrt{p}/q + \sqrt{q}/p + a\sqrt{p}q = 0}{\sqrt{p}/q + \sqrt{q}/p + \sqrt{n}/l = 0}$

- 5. Correct answer : D Sum of ages of couple = 2 x 25 = 50 years Couple + after 1st child = 3 x 18 = 54 years As age of 1st child just after being born is 0 and total age increases by 54-50 = 4 => 4/2 = 2 years (Age of eldest child is 0 here) Couple + after 2nd child = 4 x 15 = 60 years => 6/3 = 2 years Couple + after twins = 6 x 12 = 72 years => 12/4 = 3 years Present age = 6 x 16 = 96 years =>24/6 = 4 years So, present age of eldest child = 2+3+4 = 9 years
- 6. Correct answer : A Let total enrolled voters be 100x90x voted 81x were valid Winner got 54% of 81x = 43.74x votes $43.74x - (81x - 43.74x) = 1620 \ 6.48x = 1620 \ x = 250$ \therefore Voters enrolled = 25000
- 7. Correct answer : C

 $R = k.1/r^{2}$ R1 = R2 $k.11/(r1)^{2} = k.12/(r2)^{2}$ $=> 12 = 11 \cdot (r2/r1)^{2} = 162 \times (8/9)^{2} = 128 \text{ cm}$

8. Correct answer : B

Let V litres alcohol be transferred from first to second vessel. So, alcohol in first vessel = 20 - V

Alcohol in 2nd vessel = V

Water added in second vessel to fill it = 20-V

To completely fill 1st vessel V lt.

solution should be taken from 2nd vessel Alcohol in this V lt.

of solution will be = $V/(20/V) = V^2/20$

Amount of alcohol in 1st vessel now = $(20 - V + V^2/20) = 20 - (V - V^2/100) = 20 - x$

Amount of alcohol in second vessel now = $V - V^2/100 = x$

Now (20/3) lt of solution is taken from first vessel.

Alcohol in this (20/3) It of solution will be = (20 - x)/3

So, now alcohol left in first vessel = (20 - x) - [(20 - x)/3] = 2(20 - x)/3

and alcohol in second vessel = x + (20 - x)/3 equating both => x = 5 => V - (V^2/20) = 5 => V = 10

- 9. Correct answer : A Equation of line that passes through (0,0) and (1,2) : y = 2x For shaded portion in 1st quadrant Shaded portion is above that line => y ≥ 2x => y - 2x ≥ 0 & bounded by x ≥ 0 So, it must satisfy x(y - 2x) ≥ 0 (product of inequalities) For shaded portion in 3rd quadrant, y - 2x ≤ 0 and x ≤ 0 Here also, x(y - 2x) ≥ 0 (here product reverses the direction of inequalities)
- 10. Correct answer : D Let x + y/8 = t& x - y/8 = rAfter solving above 2 eqns, we get x = (t+r)/2 and y = 4(t-r)

 $f(t, r)=(t + r)/2 \times 4(t - r)=2(t^{2} - r^{2})$ f(m, n)+ f(n, m) = 2(m^{2} - n^{2}) + 2(n^{2} - m^{2}) = 0

11. Correct answer : A Let the principle be x

Amount at the end of year I \Rightarrow 11x/10

Amount at the end of year II => 121x/100.

After withdrawing Rs 5000,

amount = 121x/100 - 5000

Amount after 3rd year = 1.1*(121x/100 - 5000) = 1331x/1000 - 5500

After w/d 6000 = 1331 x / 1000 - 11500

Amount after 4 years = $1.1*(1331x/1000 - 11500) = 10000 x = 15470 \sim 15600$

12. Correct answer : D

10(6/x) = 1 =>x = 60 11 to 5 = 6 hours 6(6/x) + 7/x + 8/x + ... = 1 => 51/x + ... = 1 1 - 51/60 = 9/60is left which will be completed in the next hour. So, 3 hours after 5 PM

13. Correct answer : A

Water entered into the ship in 6 minutes = 2 tonnes Water entered in ship in 1 hour or 60 minutes =20 tonnes Water thrown out from the ship in 1 hour = 12 tonnes

So, Total amount of water entered in 1 hour into the ship = 20 - 12 = 8 tonnes Amount of water needed inside the ship to sink = 80 tonnes.

Therefore, it will take = 80/8 = 10 hours to completely sink the ship.

Distance to be covered = 55 km So, the required speed must be= 5.5 km per hour

14. Correct answer : C

Correction: In a 4000 meter race

They will meet for the first time at the end of the 5th minute at the starting point as the speed of the faster runner is twice the speed of the slower one.

=> faster runner would have travelled 2000 mtrs So, to cover 4000 mtrs, faster runner takes

5x2 = 10 mins

15. Correct answer : C Let length of train be x mtrs x+100 = 60 x 45 x 5/18 => x = 650 mtrs So, it will cross an electric pole (that has negligible length) in 650 x 18/45 x 5 = 52 sec

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16. Correct answer : C
```

```
x = 1 + 2a + 3a^2 + 4a^3 + \dots
ax = a + 2a^2 + 3a^3 + \dots
x(1-a) = 1 + a + a^2 + \dots
x = 1/(1-a^{2})^{2}
                                   ACADFM
(1-a)^2 = 1/x
a = 1 - 1/x^{1/2} \dots 1
y = 1 + 3b + 6b^{2} + 10b^{3} + \dots
by = b + 3b^2 + 6b^3 + \dots
y(1-b) = 1 + 2b + 3b^2 + 4b^3 + \dots
y(1-b)b = b + 2b^2 + 3b^3 + \dots
y(1-b)^2 = 1 + b + b^2 + b^3 + \dots
y = 1/(1-b)^3
(1-b)^3 = 1/y
b = 1 - 1/y^{1/3} \dots 2
\therefore 1 + ab + (ab)^2 + (ab)^3 + \dots
= 1/(1-ab) Keep values of a and b. from 1 and 2. We get Option A
```

17. Correct answer : B Let the 2 poles be at A, B AP = a, PB = b

Height of both poles = x P will be nearer to A as the pole at A makes 60 degree from P. $x = a \tan 60 = b \tan 30$ $\Rightarrow b/a = 3 a + b = 50$ So., a = 12.5 m

18. Correct answer : C

 $QS = 10\sqrt{2}$

PR = RS

PR || QS

Tr PQS and Tr

PRS both have their bases as diameter of circle and R,Q touch the circle,

So both are right triangles.

Also, $PR = RS \& PR \parallel QS$

So, PQRS is a square of side $10\sqrt{2}$ PS = $10\sqrt{2}$ x $\sqrt{2}$ = 20

Area of Tr PQS = $\frac{1}{2} \ge 20 \ge 100$ Ar(semi circle) = $100\pi/2 = 150$ Ar(shaded region) = 150-100 = 50

19. Correct answer : A/B

Total 3p points. 3 points can be selected in 3pC3 ways. But this also includes selection of three collinear points. Now three collinear points from each straight line can be selected in pC3 ways. Then the number of triangles is 3pC3 - pC3 = p2(4p-3)

20. Correct answer : B

Chance of A to win = $1/6 + (5/6 \times 5/6 \times 1/6) + ... = (1/6)/(1 - 25/36) = 6/11$ Chance of B = $(5/6 \times 1/6) + (5/6 \times 5/6 \times 5/6 \times 1/6) + = (5/36)/(11/36) = 5/11$ Expectations of A, B are 6, 5

DILR

- 1. Correct answer : C {85.6/(1748.8 - 85.6)} x 100 = 5.1%
- 2. Correct answer : D
 By observing the bar graph for sales, max % increase is either from 1995-96 or 1997- 98
 1995-96: {(1180 846)/846} x 100 ~ 39.5 % 1997-98: {1749 1291)/1291} x 100 ~ 35.4
 % So, max sales % increase was in 1996
- 3. Correct answer : B {(48.4 - 47.3)/48.4} x 100 = 2.27%
- 4. Correct answer : B {(1940.6 - 1748.8)/1748.8} x 100 = 10.96%
- Correct answer : D
 Can't be determined as no data is given about expenses
- 6. Correct answer : E From the chart, 21% of the total number of employees are above 60 = 21% of $2.68 = \frac{12 \times 2.68}{100} = 0.5628$ lakhs = 56.28 thousand Hence, option E is correct.
- 7. Correct answer : A

The total number of vacant seats = 6.8 - 4.2 = 2.6 lakhs Reservation for ex servicemen = 20% of 2.6 lakhs = $\frac{20 \times 2.6}{100}$ = 0.52 lakhs The total number of freshers will be hired = 2.6 - 0.52 = 2.08 lakhs Hence, option A is correct.

8. Correct answer : B

The total number of ex – servicemen applicants = 20% of 18.6 = 3.72 lakhs Reservation for ex-servicemen = 20% of 2.6 lakhs = $\frac{20 \times 2.6}{100}$ = 0.52 lakhs The reqd. % = $\frac{0.52 \times 100}{3.72}$ = 13.97% = approximately 14% 3.72 Hence, option B is correct.

9. Correct answer : C

Let the total number of central government employees = 100xThe number of central government employees of age profile of 50 years or greater than 50 years = (24 + 21)% of 100x = 45x

The number of central government employees of age profile of 20 - 29 years = 15% of 100x = 15x

The reqd. $\% = \frac{(45X-15X)\times 100}{15X} = \frac{30X\times 100}{15X} = 200\%$ Hence, option C is correct.

10. Correct answer : D

Let the total number of central government employees = 100x

The number of central government employees of age profile of 40 - 49 years = 12% of 100x = 12x

let the total number of central government employees = 100x

The number of central government employees of age profile of 30 - 39 years = 28% of 100x = 28x

ITIFIE

The reqd. $\% = \frac{(28X - 12X) \times 100}{28X} = \frac{16 \times 100}{28} = 57.14\%$ Hence, option D is correct.

Tience, option D is corre

11. Correct answer : C

AC, CD, PW, LS, SR, TG If LS CD also CD, PW = either both or none If TG =SR also but NO AC If AC = At most 2 more options. Car has TG, LS LS : CD also : PW also TG : SR also

12. Correct answer : D

Option A = More than 2 options with AC. Rejected Option B = CD is alone. Rejected Option C = CD is alone. Rejected

13. Correct answer : C

AC, CD, PW, LS, SR, TG
If LS = CD also CD, PW = either both or none If TG =SR
also but NO AC If AC = At most 2 more options.
PW, SR are there PW
∴ CD will definitely be there.
Can have LS, Can have TG, AC can't be there as if it is the second secon

Can have LS, Can have TG, AC can't be there as if it is there, there can be max 2 more options but we already have 3 more. Possible set of options: (PW, SR, CD will be in every set) LS/TG/LS, TG/None = 4 sets

14. Correct answer : B

AC, CD, PW, LS, SR, TG If LS =CD also CD, PW = either both or none If TG = SR also but NO AC If AC = At most 2 more options. Option A = CD won't be without PW. Rejected Option B = TG, SR is possible

15. Correct answer : C

Option $A = TG \Longrightarrow SR$ there,

No AC. We need 1 more option. CD, LS, PW remain. CD, PW will exist pairwise CD, LS will exist pairwise So, 3 options isn't possible

16. Correct answer : D

Both statements alone are sufficient as Angle r = Angle q And Angle p = 180 - (Angle q)

17. Correct answer : D

Statement 1: 2/16 of stadium = 1250 We can calculate max capacity from this. Statement 2: 4/16 of stadium = 2500 We can calculate max capacity from this.

18. Correct answer : B

Statement 1 is not sufficient as 2 times of both even and odd nos give an even number. Statement 2 is sufficient because even no - 1 = odd

19. Correct answer : D

Statement 1 is not sufficient as it is quadratic and will have 2 solutions Statement 2 isn't

20. Correct answer : D

N is total fishes, 5 fantails. Statements which tell us the value of N will be sufficient. From statement 1, it can be inferred that total fish are 10 From statement 2, total fish are 10.

J ACADEMY

VARC

1. Correct answer : D

The author has clearly laid out all the inefficiencies at AMCs in a clear and reasonable without showing any bias or strong emotion towards one side or the other throughout the passage.

2. Correct answer : D

Last line of the 4th paragraph in the passage: 'While AMCs have emphasized cutting edge specialty medicine, their more routine medical services need development and enhancement.' In addition, the first line of the 4th paragraph states: 'A bias toward specialization adds yet more inefficiency.' This bias has been created by the perception of the general public that AMCs can offer instant follow up if needed. Therefore, if better primary care were offered, it would reduce the inefficiencies that arise from specialization due to general public perception.

3. Correct answer : D

By talking about the inefficiencies of AMCs, the author also compares it with other health care entities.

4. Correct answer : C

3rd paragraph is mainly about how inefficiencies are caused at AMCs due to the obligations that physicians have to different groups. The author then goes on to give an example of the obligation that physicians have to students and how this causes ill care of patients. 'For the benefit of medical students, physicians may order too many tests, prolong patient visits, or encourage experimental studies of a patient.' Therefore, faculty physicians place education ahead of patient care.

5. Correct answer : C

In the 1st paragraph, 'In the face of considerable adversity, the WTUL made a contribution far greater than did most historical footnotes.' The passage serves to remind readers of the WTUL.

6. Correct answer : D

The passage states that the AFL was a potent but largely absent ally, and that the AFL saw little economic benefit in working with the WTUL, which served as political cover for AFL.

7. Correct answer : A

According to 2nd paragraph, WTUL represented a largely unskilled labor force.

- 8. Correct answer : B Option B is the gist of the passage. 2nd last and last paragraph emphasized this point more.
- Correct answer : C In the 2nd paragraph, the passage clearly states the companies followed the plan diligently.

10. Correct answer : D

It is clearly implied from 4th para 2nd line that companies which implemented strategic planning had better growth figures than companies otherwise.

11. Correct answer : B

Two factors are noted in the passage. 1st, the per capita production rate has not been as high as the production increase, without regard to population size. 2nd, the rate of increase over the last 10 years has been slower

12. Correct answer : C

Even if it were true that there are more self-employed women than men, it does not explain why this number increases 5 times faster than men. Option (a) supports the argument by showing that it has become more convenient for women to be self-employed. Option (b) gives a means to that end. Option (d) provides evidence to support the claim.

13. Correct answer : B

Option (b) is the best answer. The statement is an admonition for people to be aware of contaminants, a reference to physical and chemical hazards. Alternatives (a) & (c) might be implied, but they are not such good choices as (b). Option (d) isn't implied.

14. Correct answer : B

'Farther' is used to talk in the context of distance, like 'He ran farther away from the shop' whereas 'further' is used in the adverbial sense or as an adjective meaning 'more extended', like 'I have nothing further to say.' The given sentence refers to distance, hence 'further' is the correct choice. 'Historic' means having an importance in history whereas 'historical' refers to an event that took place in history. In this context, 'historic' is the right choice. Both words 'distrust' and 'mistrust' mean the same 'the trait of not trusting', but generally 'distrust' is used more with cases where experience is involved. So, we would go with distrust as it is described as 'healthy'. So 'distrust' is the correct choice. 'True' is the better choice here as it describes 'story'. Compliment means a remark expressing praise. Complement means something added to make complete.

15. Correct answer : B

Decline 'regretfully' is the correct usage. It means being sorry to decline. Sensuous means taking delight in beauty. Hence is perfect for 2nd sentence. Beside means next to. Besides

means apart from or and another thing. So 'beside should be used in given context. Stationary means 'stand still'. 5th statement can be correctly written as, ' As the water began to rise above the danger mark, the signs of an imminent flood were clear.

- 16. Correct answer : C In c, it should be 'of all sorts'
- 17. Correct answer : C In c, 'host' refers to home which is not suitable here.
- 18. Correct answer : B

Correction: *that almost Lukewarm means less enthusiastic and electrifies is the correct usage.

19. Correct answer : A

B and C are incorrect. B should be 'thinking what to do'C should be 'took a shower'. A & D are the correct sentences.

20. Correct answer : C

B should be 'blamed for the thinning of the' C 'many an offending' is incorrect usage.

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