

delivered deep into the muscle, others just under the skin.

Miniaturising the machine took Bioject seven years and \$ 10 m. The company had to find a way of ensuring that the pressure applied to deliver the medicine remains constant for each injection eventhough the volume of carbon-dioxide within the cannister is always changing. It also had to make sure that the syringe can deliver variable amounts of the liquid and that the materials used to make the device do not buckle under the high pressure applied to them The company developed a range of five different syringes, each tailored to suit a particular need. Children, for example, have less fat under their skins, and so the force with which the medicine is delivered, should not be so great as for older, fatter adults.

Some snags remain. Although each Biojector can deliver up to 50,000 shots, they are costly, almost \$1,000 a piece, and 90 cents for each syringe. A disposable syringe with a needle typically costs 20 cents. Still some American hospitals and private doctors have started using the Biojector. If the company can get the price down, more may follow; in time injections may be no more traumatic than swallowing pills.

Reg. No. : .....

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Sub. Code : GNEN 3 A

U.G. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2015.

Third Semester

English – Non-Major – Elective

ENGLISH FOR COMPETITIVE EXAMINATIONS

(For those who joined in July 2012 and afterwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer

1. A person who leaves one's own country to go abroad and live there is  
(a) emigrant (b) immigrant  
(c) alien (d) exile
2. The Synonym for 'Allegiance' is \_\_\_\_\_  
(a) helplessness (b) hostility  
(c) loyally (d) delay





PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Choose the correct answer.

11. (a) (i) One who is famous and admired is \_\_\_\_\_  
(1) eminent (2) imminent  
(3) emigrant (4) immigrant
- (ii) A strongly made building used for defence.  
(1) forte (2) fort  
(3) ford (4) shire
- (iii) Quiet and calm is \_\_\_\_\_  
(1) Peaceable (2) Peaceful  
(3) Peace (4) none of these
- (iv) The synonym of "Gregarious" is \_\_\_\_\_  
(1) religious  
(2) friendly  
(3) negligent  
(4) ancient
- (v) The antonym of "Beneficent" is \_\_\_\_\_  
(1) deathly (2) troublesome  
(3) limited (4) abnormal

Or

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- (b) (i) A long pore with a wide flat blade at one end following a boat is \_\_\_\_\_

(1) ore (2) our  
(3) Seam (4) seem

- (ii) An ordinance given by a ruler is \_\_\_\_\_

(1) ordinance (2) ordnance  
(3) official (4) officious

- (iii) "Very fine and expensive" is \_\_\_\_\_

(1) luxury (2) luxurious  
(3) luxuriant (4) none of these

- (iv) The synonym of "Balustrade" is \_\_\_\_\_

(1) castle (2) avenue  
(3) restaurant (4) fence

- (v) The antonym of "Insatiable" is \_\_\_\_\_

(1) unlucky (2) greedy  
(3) satisfied (4) attractive

12. (a) (i) A parliamentary committee has expressed \_\_\_\_\_ over reports that government's efforts for the upliftment of \_\_\_\_\_ tribals have made little progress.

(1) unhappiness ... uncivilised  
(2) unpleasantness ... native  
(3) displeasure ... primitive  
(4) annoyance ... ancient

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(ii) The \_\_\_\_\_ over the use of animals in experiments seems to be developing into an \_\_\_\_\_ conflict between those interested in animal welfare and those interested in medical research.

- (1) differences ... important
- (2) argument ... sensational
- (3) contradiction ... social
- (4) controversy ... irreconcilable

(iii) The Indian School of Business \_\_\_\_\_ students draft business plans although it is not part of their \_\_\_\_\_.

- (1) makes ... course
- (2) prepares ... objective
- (3) suggests ... plans
- (4) encourages ... curriculum

(iv) JOYOUS – EUPHORIA : Select a pair that suits this analogy.

- (1) fury - annoyance
- (2) eager - anxiety
- (3) anger - indignation
- (4) lovable - romantic

(v) KNOWLEDGE — IGNORAMUS : Select a pair that suits this analogy.

- (1) sleep — insomniac
- (2) intelligence — shrewd
- (3) fun — humorous
- (4) reality — surrealistic

Or

(b) (i) Industrialists who have several \_\_\_\_\_ about the new export-import policy announced by the government have approached the Finance Minister for a \_\_\_\_\_ of the policy.

- (1) apprehensions... review
- (2) hopes... improvement
- (3) suggestions... rejection
- (4) views... fragmentation

(ii) The speaker quoted \_\_\_\_\_ from published documents to \_\_\_\_\_ his argument that scientific advancement has not always been for the good of humanity.

- (1) literally... establish
- (2) liberally... maintain
- (3) massively... substantiate
- (4) extensively... buttress



(iii) A report by the UN Population Fund argues that larger families and fast growing population \_\_\_\_\_ development and perpetrate poverty by slowing growth and \_\_\_\_\_ consumption away from the poor.

- (1) destroy... taking
- (2) support... encouraging
- (3) decelerate... divulging
- (4) obstruct... diverting

(iv) TRUCK — CARGO: Select a pair that suits this analogy.

- (1) ship - water
- (2) aircraft - fuel
- (3) bus - passengers
- (4) theatre - movie

(v) JAPAN - KIMONO: Select a pair that suits this analogy.

- (1) Europe - continent
- (2) India - saree
- (3) Indonesia - archipelago
- (4) Bangladesh - taka

13. (a) (i) He took \_\_\_\_\_ painting home. Choose the correct article.

- (1) an (2) a
- (3) the (4) none of these

(ii) The neck of \_\_\_\_\_ giraffe is very long. Choose the correct article.

- (1) an (2) a
- (3) the (4) none of these

(iii) I reached home in time \_\_\_\_\_ dinner. Choose the correct preposition.

- (1) for (2) at
- (3) by (4) none of these

(iv) He was happy to be back \_\_\_\_\_ his people. Choose the correct preposition.

- (1) among (2) with
- (3) for (4) none of these

(v) The sun \_\_\_\_\_ in the east. Choose the correct tense.

- (1) rise (2) rises
- (3) is rising (4) none of these

Or

(b) (i) Write a short note on 'articles'.

(ii) Write a short note on 'Preposition of Time'.



14. (a) (i) The police have arrested several people  
in connection with the robbery  
and none of them have been released  
so far. No error. Spot the error.

- (1) a (2) b  
(3) c (4) d  
(5) e

(ii) An important member of a gang of thieves  
who had indulged in several cases of robbery  
have now surrendered before the police.  
No error. Spot the error.

- (1) a (2) b  
(3) c (4) d  
(5) e

(iii) Seema has won this year's Sahitya  
Akademi award for her book *Tears of Joy*  
which comprises of sixteen poems.  
No error. Spot the error.

- (1) a (2) b  
(3) c (4) d  
(5) e

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(iv) Arrange the following in logical order.

- A. King Norodom Sihanouk today offered flowers at a shrine containing the relics of Buddha.  
B. Cambodia, which is 95 per cent Buddhist, considers the relics holy.  
C. Thousands of Cambodians watched King Sihanouk offering lotus and jasmine at the holy shrine.  
D. The relics of Buddha were handed over to Cambodia by Nepal about 50 years ago.

- (1) CABD (2) ACBD  
(3) BACD (4) ADCB

(v) Arrange the following in logical order.

- A. There were jokes galore, songs, dances, tete-e-tetes and serious discussions in different parts of the large dinner hall.  
B. South Indian, Mughalai, American and continental dishes vied with one another for the guests' attention.

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C. The dinner hosted by the Governor in honour of the visiting US delegation was a gourmet's delight.

D. The US delegation seemed immensely pleased with the Indian hospitality.

(1) CBAD (2) BCAD

(3) DCBA (4) ACBD

Or

(b) (i) Many students opt for biology

because medicine is bone of the subjects

that attracts them. No error.

d e

Spot the error.

(1) a (2) b

(3) c (4) d

(5) e

(ii) This self, which contains a number

of costly articles collected from different

countries were bought from Mumbai.

No error. Spot the error.

(1) a (2) b

(3) c (4) d

(5) e

(iii) Having exempted from Part A of the

examination, he felt sure that

he could pass Parts B and C in one sitting.

No error. Spot the error

(1) a (2) b

(3) c (4) d

(5) e



(iv) Arrange the following in logical order.

- A. Senior citizens, no doubt, deserve special consideration.
- B. India has been slowly and painstakingly moving towards a market-driven economy.
- C. The Finance Minister's proposal to allow higher interest rate on deposits by senior citizens will put the clock back by several years.
- D. The government has to think up schemes for helping this special class of people without taking steps that would reverse the forward march of the country's economy.

- (1) DCBA      (2) CBAD
- (3) BCAD      (4) CABD

(v) Arrange the following in logical order.

- A. The four metros continued to attract cellular subscribers at a much faster pace than the rest of India..
- B. The number of cellular subscribers is poised to touch the one-crore mark by the end of December.

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- C. The intense competition among the four major companies has pushed up sales in an unprecedented manner.
- D. According to the Cellular Operators' Association of India, the figure stood at 97.30 lakhs at the end of November.

- (1) CBDA
- (2) ABCD
- (3) BCDA
- (4) BDAC

15. (a) (i) Write sentences using the following:

(1) confidant (2) confident

(ii) The synonym of 'occidental' is \_\_\_\_\_

- (1) by chance
- (2) idiotic
- (3) western
- (4) healthy

(iii) The antonym of 'Inherent' is \_\_\_\_\_

- (1) local
- (2) external
- (3) illogical
- (4) simple

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(iv) AIRCRAFT — COCKPIT : Choose the appropriate analogy.

- (1) ship - hull
- (2) refrigerator - compressor
- (3) flower - pollen
- (4) hail - stage

(v) Researchers ——— some fundamental ideas about humans' earliest ancestors when they reported the ——— discovery of a primate skull between six and seven million years old.

- (1) overthrew... surprising
- (2) overturned... startling
- (3) disputed... wellknown
- (4) legitimised... fantastic

Or

(b) (i) He is ——— MP. Choose the correct article.

- (1) the            (2) an
- (3) a             (4) none of these

(ii) He climbs ——— the tree. Choose the correct preposition.

- (1) in            (2) on
- (3) above       (4) over

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(iii) Sam ——— his college. Choose the correct tense.

- (1) is liking
- (2) likes
- (3) like
- (4) none of these

(iv) Arun is very pretty ———. Add a question tag?

- (1) is she?
- (2) isn't she?
- (3) wasn't you?
- (4) none of these

(v) Although the party leadership was able to ——— the majority of the MPs, there were some ——— who continued to ask questions.

- (1) convince... sceptics
- (2) discipline... remnants
- (3) sympathise with ... dissidents
- (4) reconcile... rebels

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PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Choose the correct answer:

16. (a) (i) Lasting only for a limited time.  
(1) temporal  
(2) temporary  
(3) terrible  
(4) terrific
- (ii) excellent  
(1) terrific  
(2) terrible  
(3) terror  
(4) fear
- (iii) not bent or curved  
(1) straight  
(2) strait  
(3) stock  
(4) stoke
- (iv) Narrow passage of water between two areas of land.  
(1) straight  
(2) strait  
(3) stock  
(4) stoke

(v) The synonym of 'Antipathy' is \_\_\_\_\_

- (1) dislike  
(2) approval  
(3) similarity  
(4) notoriety

(vi) The synonym of 'Artless' is \_\_\_\_\_

- (1) incapable  
(2) dull  
(3) stupid  
(4) honest

(vii) The antonym of 'Valedictory' is \_\_\_\_\_

- (1) inaugural  
(2) short-lived  
(3) reciprocal  
(4) final

(viii) The antonym of 'Wary' is \_\_\_\_\_

- (1) having no money  
(2) showing no respect  
(3) haphazard  
(4) careless

Or



(b) (i) Short piece of writing on a subject

- (1) assay
- (2) essay
- (3) letter
- (4) author

(ii) Connected with the sense of hearing

- (1) aural
- (2) oral
- (3) spoken
- (4) listening

(iii) One of every two

- (1) alternate
- (2) alteration
- (3) alternative
- (4) affection

(iv) Keep away from

- (1) avoid
- (2) evade
- (3) bath
- (4) bathe

(v) The synonym of 'Buxom' is \_\_\_\_\_

- (1) huge
- (2) plumb
- (3) talkative
- (4) softspoken

(vi) The synonym of 'Boisterous' is \_\_\_\_\_

- (1) childish
- (2) suave
- (3) noisy
- (4) ultimate

(vii) The antonym of 'Laudatory' is \_\_\_\_\_

- (1) contemptuous
- (2) fussy
- (3) energetic
- (4) deep rooted

(viii) The antonym of 'Loathe' is \_\_\_\_\_

- (1) scare
- (2) fear
- (3) love
- (4) hate



17. (a) (i) The extraordinary \_\_\_\_\_ of James Bond spanning several decades shows that the action hero has an \_\_\_\_\_ charm that captures the imagination of cinegoers.
- (1) popularity ... unusual
  - (2) life...sophisticated
  - (3) longevity...unique
  - (4) magic...extraordinary
- (ii) The new residential buildings in Ghaziabad, which went \_\_\_\_\_ last year, have suddenly found takers and the \_\_\_\_\_ levels have gone up sharply.
- (1) unclaimed... ownership
  - (2) unoccupied... demand
  - (3) unnoticed... claim
  - (4) abegging... occupancy
- (iii) A sound and light show at the Cellular Jail in the Andamans tries to \_\_\_\_\_ the torture \_\_\_\_\_ on the freedom fighters by the British colonisers.
- (1) show... subjected
  - (2) recreate... inflicted
  - (3) drammatise... suffered
  - (4) exhibit... undergone

- (iv) Indians never \_\_\_\_\_ unitedly by the way the Americans do when \_\_\_\_\_ is meted out to a fellow citizen on foreign soil.
- (1) react... injustice
  - (2) protest... ignominy
  - (3) represent ... harshness
  - (4) demonstrate ... discrimination
- (v) The US declaration that it can \_\_\_\_\_ win wars against both Iraq and North Korea reflects the supreme \_\_\_\_\_ and lack of foresight that have become the hallmarks of the present US administration
- (1) easily... assertion
  - (2) gratuitously... insensitivity
  - (3) simultaneously... confidence
  - (4) effortlessly... overconfidence
- (vi) Several drugs \_\_\_\_\_ in foreign countries are freely sold in India, although their side-effects are \_\_\_\_\_ the world over.
- (1) protected... understood
  - (2) prevented... unknown
  - (3) banned... recognised
  - (4) banished... experienced



(vii) As an earthquake hits an area with groundshaking \_\_\_\_\_ a slow earthquake may sound a \_\_\_\_\_ in terms.

- (1) power... falsification
- (2) intensity... contradiction
- (3) movement... paradox
- (4) energy... confrontation

(viii) Although many people publicly \_\_\_\_\_ that astrology is not a science, a survey has revealed that not many are prepared to \_\_\_\_\_ it altogether.

- (1) deny... give up
- (2) assume ... repudiate
- (3) emphasise... accept
- (4) assert ... discard

Or

(b) (i) The police today \_\_\_\_\_ an attempt by some miscreants to hurl bombs at a religious \_\_\_\_\_ on the eve of Christmas.

- (1) failed ... crowd
- (2) dispersed ... sect
- (3) foiled ... congregation
- (4) confronted ... society

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(ii) The gradual and painful \_\_\_\_\_ from a public sector-based economy to liberalisation and privatisation has resulted in a number of government projects being \_\_\_\_\_

- (1) escalation... cancelled
- (2) transformation... disinvested
- (3) prevarication... disinvested
- (4) assimilation... nationalised

(iii) \_\_\_\_\_ a new savings scheme, the President today said that stability and trust are the cornerstones of \_\_\_\_\_ relationships.

- (1) Declaring... stable
- (2) Detailing... systematic
- (3) Launching ... enduring
- (4) Announcing ... recalcitrant

(iv) A disturbing pointer to our social progress or the lack of it is the heinous \_\_\_\_\_ of sati which is not only practised even today in some parts of India, but eulogised by people including the relatives of the \_\_\_\_\_

- (1) ritual.., victim
- (2) worship... deceased
- (3) crime... husband
- (4) tradition... atrocity

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(v) The current economic slowdown has forced companies to have a fresh look at the \_\_\_\_\_ available to cut costs and stay \_\_\_\_\_

- (1) finances ... profitable
- (2) options ... competitive
- (3) choices ... healthy
- (4) alternatives ... afloat

(vi) A major conflict, the United Nations has warned, would result in millions of \_\_\_\_\_ whose \_\_\_\_\_ would be a major challenge for the world.

- (1) prisoners... release
- (2) refugees... rehabilitation
- (3) destitutes... future
- (4) landmines... deactivation

(vii) Believe it or not, the US State Department has a division \_\_\_\_\_ devoted to the \_\_\_\_\_ of dictatorship to American democracy.

- (1) emphatically... disruption
- (2) primarily... manipulation
- (3) solely ... conversion
- (4) fundamentally ... demolition

(viii) The International Labour Organisation has set up a World Commission to study the Social \_\_\_\_\_ of Globalisation \_\_\_\_\_ 28 eminent persons from various countries

- (1) Values... consisting
- (2) Aspects... containing
- (3) Measures... including
- (4) Dimensions... comprising

18. (a) Select a pair that suits the analogy in the following pairs :

(i) PATIENT - HOSPITAL

- (1) teacher - school
- (2) pilot - aeroplane
- (3) litigant - court
- (4) priest - church

(ii) PAINTER - BRUSH

- (1) mason - wall
- (2) carpenter - furniture
- (3) sculptor - mallet
- (4) teacher - book



(iii) PIG - BACON

- (1) sheep - mutton
- (2) goat-kid
- (3) chicken - hen
- (4) cow - bovine

(iv) EDIT - MANUSCRIPT

- (1) chisel - wood
- (2) touch up - photograph
- (3) irrigate - water
- (4) solicit - favour

(v) LISTLESS - ENERGY

- (1) frivolous - playfulness
- (2) silent - sound
- (3) energetic - activity
- (4) sorry - remorse

(vi) BOOKS - VORACIOUS

- (1) food - energetic
- (2) education - pedagogic
- (3) beauty - bewitching
- (4) power - megalomaniac

(vii) MEMORY - AMNESIA

- (1) comparison - allegory
- (2) breath - asphyxiation
- (3) flight - aviation
- (4) food - dyspepsia

(viii) SEA - LITTORAL

- (1) state - contiguous
- (2) island - archipelago
- (3) river - riparian
- (4) cape - peninsula

Or

(b) Select a pair that suits the analogy in the following pairs :

(i) SLEEP - SEDATIVE

- (1) pain - analgesic
- (2) fever - antipyretic
- (3) food - digestive
- (4) hunger - appetiser

(ii) MAPS - CARTOGRAPHER

- (1) wood - carpenter
- (2) eyes - ophthalmologist
- (3) dictionary - lexicographer
- (4) building - architect





(ii) The District Collector visited the village  
a  
with a view to convince the villagers  
b  
of the need to widen the road so that buses  
c d  
could ply through the village. No error.  
e

- (1) a (2) b  
(3) c (4) d  
(5) e

(iii) The purpose for which a series of  
a b  
attacks were made on the factory  
c  
premises by workers were not revealed  
d  
by the investigating officers. No error.  
e

- (1) a (2) b  
(3) c (4) d  
(5) e

(iv) After the death of Anoop's father  
a  
it was his uncle who looked him  
b c  
after until he got a job.  
d  
No error.  
e

- (1) a (2) b  
(3) c (4) d  
(5) e

(v) Unable to get up from bed the old man  
a b  
prayed God to let him die  
c  
without further suffering. No error.  
d e

- (1) a (2) b  
(3) c (4) d  
(5) e



(vi) The children went to the school  
a  
not knowing that the Government had  
b c  
declared a holiday in view of the heavy  
d  
rains. No error.

- e  
(1) a (2) b  
(3) c (4) d  
(5) e

(vii) In recognition of his success  
a  
in marketing the new product, the  
b  
company offered him a substantial  
c d  
raise. No error.

- e  
(1) a (2) b  
(3) c (4) d  
(5) e

(viii) This Several of her friends rang up Neha  
a b  
to congratulate her for her success  
c  
in the Civil Services Examination.  
d  
No error.

- e  
(1) a (2) b  
(3) c (4) d  
(5) e

Or

(b) Arrange the following in logical order:

- (i) A. Railway guard Sukumar Das locked up a manned level crossing in West Bengal after being continuously on duty for 72 hours and went home to take rest  
B. Juvenal could not have anticipated what happened in the 21<sup>st</sup> century in West Bengal  
C. For the next few hours there was complete chaos at the level crossing as hundreds of vehicles were held up.



D. "Who will guard the guards?" was the satirical query posed by poet-philosopher Juvenal in Ancient Rome.

- (1) DACB      (2) DBAC  
(3) ACBD      (4) ACDB

(ii) A. The growing reach of the cable and satellite TVs has also made sure that advertisers get more value for their money.

B. Advertisement revenues on TV are estimated to go up by 12-15% this year.

C. Not a bad performance, considering the difficult circumstances the industries are going through.

D. Television networks are spending heavily to get higher viewership.

- (1) ADBC      (2) DABC  
(3) BCAD      (4) BCDA

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(iii) A. 18-year-old Lionel has sued her father, uncle, cousins and half-siblings claiming they stopped her trust funds of more than \$ 1 billion.

B. Eight years ago, when Lionel Pritzker won the starring role in *A Little Princess*, it sparked off a bitter feud between her parents.

C. Lionel's father argued that fame might not be healthy for a ten-year-old girl and filed a court motion that she needed his approval.

D. Now the young actress has turned the tables filing a law suit of her own.

- (1) BCDA      (2) ABCD  
(3) ACDB      (4) ADBC

(iv) A. The range of services being offered by the e-seva centres is being expanded considerably in the coming months.

B. What is more, the centres are being equipped with radios and television sets so that customers can enjoy channel music or gain access to information.

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C. In Singapore such centres offer about 1500 services, he said.

D. The minister for information technology said today that the number of services offered is being increased from the present 35 to about 100 in six months' time.

(1) DACB (2) ABDC

(3) ADCB (4) ADBC

(v) A. If American humorist Mark Twain were alive today, his quip would be about 'free and open' software Lunux, and not about weather.

B. But suddenly it seems the weather in WWW has changed.

C. "Everybody talks about it, but nobody does anything about it".

D. After a decade of hype, Lunux is finally out in the open and ready to enter the mass computer desktop.

(1) ACBD (2) CADB

(3) ABDC (4) CABD

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(vi) A. There just was no fight.

B. To lose a test visible three days was abysmal.

C. It was easily one of the worst batting displays I have seen in a long time.

D. Losing is acceptable, but not going down in such a fashion.

(1) DBCA (2) DCBA

(3) CABD (4) CADB

(vii) A. If there are more on one side than on the other, even by the majority of one, can it be legitimately claimed that they speak for God?

B. A greatly cherished illusion is that the voice of the people is the voice of God.

C. A far more acceptable motto is that the voice of reason is the voice of God.

D. There are many people and they speak in discordant voices.

(1) BCDA (2) BDAC

(3) BADC (4) DBAC

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(viii) A. Most uterine fibroids are benign growths.

B. Fibroids are little lumps in the uterus which are a cause of concern, whether benign or malignant.

C. Most women who have fibroids are not aware of it as the growths can remain small and not give out any symptoms.

D. They occur in about 20 to 25 per cent of women.

(1) CBAD (2) BDAC

(3) BCAD (4) BADC

20. (a) Read the following passage and answer the questions given below:

Radical ideas appear to be grabbing the attention of engineers and techno-experts who are devoting their time and energy to changing the face of passenger rail travel. If these ideas take shape, a day return trip from Bristol to Boston aboard the supersonic "Supere Maglev" the train in pipes may become a reality by 2050.

Imagine supersonic trains cruising at speeds seven times that of the speed of sound and a network of tube-trains criss-crossing the

entire globe. Already, high speed trains such as Eurostar, TGVs, Super Voyagers, Pendolino and Maglev have become a reality and a new world record of 552 km per hour has been achieved.

Now picture this arrangement for an Atlantic Tube where the tube infrastructure is constructed of concrete and built on land, then taken by ship to where it is needed. Dedicated tubes for each direction would be assembled at some 50 metres below sea level and tethered to the sea bed or to surface floats.

Combined with land tubes, a global system running to several thousand kilometres is envisaged. To ensure absolutely no physical contact between train and tube, the system would be fitted with computers that permanently measure clearances and then adjust the train's trajectory by fractions of a millimetre to reflect any change in the position of the tube.

A further practical consideration relates to the amount of acceleration or deceleration people can comfortably bear. The proposal plans for uniform acceleration for the first six minutes of the route and a period of nearly 15 minutes for deceleration to the terminus. The remainder of the journey would be at a cruising speed of 3,700 km per hour, making a



trip from the U.K. to the west coast of the U.S. in less than two hours

This scenario was conjured up by Tony Roche, an engineer who has spent four decades with UK Rail, in this year's George Stephenson lecture held recently in New Delhi. He pointed out that the principal constraint on how fast a magnetic' levitation train can go, apart from power supply, is associated with friction between the train and the air around it, since air resistance rises exponentially with speed. By enclosing the train in a tube from which the air has been evacuated, a system can be created without aerodynamic resistance and in these circumstances the power requirements are directly proportional to speed.

Using these two engineering concepts of a vacuum tube and superconductivity, groups of engineers in Japan and the US. are looking into the concept of a global network of tubes in which trains would travel at seven times the speed of sound and provide stiff competition to air travel.

Mr. Roche said it was an article by Jules Verne in the *Strand* magazine in 1895 that captured the imagination of an American entrepreneur, Frank Davidson, who with his colleagues at the Massachusetts Institute of Technology and other in Japan, created the vision of the global tube train system.

- (i) This passage is taken from
- (1) a lecture
  - (2) a newspaper report
  - (3) a book
  - (4) a Railway Time Table
- (ii) Engineers envisage trains running
- (1) at the same speed as aeroplanes
  - (2) faster than aeroplanes
  - (3) at seven times the speed of sound
  - (4) at 552 km per hour
- (iii) The air in the tube will be evacuated
- (1) to increase the speed of the train
  - (2) to reduce aerodynamic resistance
  - (3) to make travel safer
  - (4) so that passengers can breathe fresh air
- (iv) How much time will the train take to reach the speed of 3700 km per hour?
- (1) six minutes
  - (2) two hours
  - (3) fifteen minutes
  - (4) not specified in the passage



- (v) The greatest speed at which a train runs now is
- (1) 200 km per hour
  - (2) the same as the speed of sound
  - (3) seven times the speed of sound
  - (4) 552 km per hour
- (vi) When the speed of a train increases, air resistance
- (1) decreases
  - (2) increases
  - (3) remains the same
  - (4) becomes zero
- (vii) The high speed trains of the future will be monitored by
- (1) engineers of Bristol and Boston
  - (2) engineers of U.S.A. and Japan
  - (3) computers
  - (4) power supply
- (viii) Suggest a suitable title.

Or

- (b) Write a precise of the following passage:

Injections alarm some patients; they can also alarm doctors and nurses. In America several thousand healthcare workers contract hepatitis every year by pricking themselves

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with needles carrying contaminated blood. They run a risk of contracting many other diseases too. Safer injections that cause less pain to patients are now available, but at a high price.

The "Biojector" made by Bioject of Portland, Oregon is a hand held device about 20 cm along. A plastic container that looks like a syringe without a needle fits on to one end. The plunger on the syringe is pressed not by a finger, but by a blast of carbon-dioxide which works much quicker. The drug gets blurted out of the fine blunt nozzle, at the end of the syringe at 800 km per hour; at that speed it hardly notices when it hits the patient's skin and passes through. As the resulting hole is a third of the area of the syringe needle, and the whole process takes but a fraction of a second, the patient hardly notices either. Slip on a new sterile syringe and you are ready for the next patient with almost no risk of infection.

Such jet-propelled injections have been around for decades often used in immunisation programmes. However, they were administered by cumbersome costly machines, with large tanks full of compressed carbon-dioxide, big, unwieldy hand guns. The nozzles were made of rubies which were too expensive to change for each new immunisation. Fine control over the depth to which the drug was injected was not possible. Some drug must be

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