

Reg. No. :

Name :

Third Semester B.A./B.Sc. Degree Examination, January 2023

First Degree Programme Under CBCSS

Language Course – English

EN 1311.1/EN 1311.3 : ENGLISH FOR CAREER

(Common for B.A./B.Sc. & Career Related Group 2(a))

(2019 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

- I. Answer **all** the following questions. Follow the instructions given in the brackets wherever needed.
 1. The correct spelling of the word 'biscut' is _____.
 2. The word that is the antonym of "callous" is _____
 3. Give a synonym for the word 'deceptive'.
 4. What is _____ (breed) in the bone will not wear out of the flesh.
(Use the correct tense form of the verb in brackets)
 5. The adjective form of reluctance is _____.
 6. The child, thinking all was safe, _____ (attempt) to cross the road.
(Use the correct tense form of the verb in brackets)
 7. The word 'intricate' is synonym for _____.

8. I'm having some trouble work out the solution to this equation.

(Underline the error)

9. Mr. Pritchard has been to Scotland recently, _____?

(Complete the sentence with a question tag)

10. They've _____ the meeting. (Use the appropriate phrasal verb)

(a) Called out

(b) Called in

(c) Called by

(d) Called off

(10 × 1 = 10 Marks)

II. Answer **any eight** of the following questions.

11. Provide one-word substitutes for any **two** of the phrases :

(a) A number of fish swimming together

(b) Easily set on fire

(c) In a timely manner

(d) Protected against diseases

12. Give the antonyms of **two** of the following words :

(a) genuine

(b) coarse

(c) boisterous

13. Make sentences of your own with any **two** of the following phrasal verbs :

(a) clamp down on

(b) fall through

(c) make up

(d) stick up for

14. Choose the correct option from those given in the brackets :
- (a) The four men _____ towards us. (is walking/are walking).
- (b) The old woman _____ clothes for a living. (makes/make)
15. Fill in the blanks using a collective noun from those given below :
- (pack, deck, herd, chest, team)
- (a) He hid this secret diary in a _____ of drawers in his room.
- (b) I spotted a _____ of wolves at the sanctuary.
16. Use the correct tense of the verb in the bracket :
- (a) We _____ (has live) here for ten years.
- (b) I _____ (receive) his letter a week ago.
17. Fill in the blanks using the suitable degree of the adjective given in the brackets :
- (a) Lead is _____ than other metals. (heavy)
- (b) The tiger is the _____ of all animals. (fierce)
- Correct the errors in the words given in italics.

18. (a) It is *recommendable* that you charge the mobile phone before first use.
- (b) Kindly note our address for all *farther* communication.
19. (a) She *vested* all her time in chatting and did not find the time to complete her work.
- (b) In case of a land dispute, the officials will determine how the property is to be *dividend*.

20. Fill in the blanks with suitable words from those given in brackets :
- (obtain, assimilate, perennial, develop)

It is your duty to train and _____ your mind and acquire knowledge, as much knowledge as you possibly can _____. Knowledge is like a deep well, fed by _____ springs, and your Mind is the little bucket that you drop into it : you will get as much as you can _____.

21. Choose the correct option from the brackets :

- (a) Eight dollars _____ the price of a ticket. (is/are)
- (b) I _____ be honoured to attend the function. (shall/would)

22. Fill in the blanks with the appropriate word from the brackets :

(before, quite, never, well, once)

- (a) These mangoes are _____ ripe.
- (b) He _____ met me in Cairo.

23. Use the correct tense of the verb in the brackets :

- (a) The tempest _____ the ship ashore. (blow)
- (b) _____ over the fence, the thief escaped. (jump)

Read the paragraph and answer the question given below :

24. The National Institute of Oceanography (NIO) in Goa developed a real-time reporting and Internet accessible coastal sea-level monitoring system which has been operational since 2005. The gauge uses a cellular modem to put on the Internet real-time sea-level data. By using a cellular phone network, coastal sea-level changes are continuously updated on to a web-server. The sea-level gauge website can be made available to television channels to broadcast real-time visualisation of the coastal sea level, particularly during oceanic hazards such as storm surges or a tsunami. A network of such gauges along the coast and the islands that lie on either side of the mainland would provide data to disaster management agencies to disseminate warnings to coastal communities and beach tourism centres.

- (a) What is the function of the NIO's gauge?
- (b) Comment on an additional benefit of such gauges.

25. A sanctuary may be defined as a place where Man is passive and the rest of Nature active. Till quite recently Nature had her own sanctuaries, where man either did not go at all or only as a tool-using animal in comparatively small numbers. But now, in this machinery age, there is no place left where man cannot go with overwhelming forces at his command. He can strangle to death all the nobler wild life in the world today. Tomorrow he certainly will have done so, unless he exercises due foresight and self-control in the meantime.

- (a) What predictions do the author make regarding the fate of sanctuaries?
- (b) Identify the word in the passage which means the following : the ability to predict what will happen or be needed in the future?

26. The first and most important rule of Legitimate or popular government, that is to say, of government whose object is the good of the people, is therefore, as I have observed, to follow in everything the general will. But to follow this will it is necessary to know it, and above all to distinguish it from the particular will, beginning with one's self: this distinction is always very difficult to make, and only the most sublime virtue can afford sufficient illumination for it, As, in order to will, it is necessary to be free, a difficulty no less great than the former arises – that of preserving at once the public liberty and the authority of government.

- (a) How does the author describe a legitimate or popular government?
- (b) What is the one virtue that is necessary for the people to be in a position to make known their will?

(8 × 2 = 16 Marks)

III. Answer **any six** of the following questions.

27. Fill in the blanks with the correct option :

- (a) He had asked you to _____ your answers, hadn't he?
(mail him/mail to him)
- (b) The manager _____ all the claims of the employee and dismissed him. (reputed, refuted)
- (c) _____ prices cause hardship to the poor. (Escalating/Exciting)
- (d) I like Ashley a lot, she's a very _____ person. (denying/dynamic)

28. Fill in the blanks with suitable phrases from those given in the brackets :
(ran out, tear up, put up, set up, wore off, pass out, cut back, let in, go out)
- (a) My doctor wants me to _____ on sweets.
 - (b) We _____ of shampoo so I had to wash my hair with soap.
 - (c) The effects of the sedative _____ after a few hours.
 - (d) I cannot _____ with his attitude.
29. Correct the errors in any **four** of the following sentences :
- (a) Either my mother or my father are coming to the meeting.
 - (b) George and Tamara doesn't want to see that movie.
 - (c) Your pants is at the cleaner's.
 - (d) One of my sisters are going on, a trip to France.
 - (e) There was fifteen candies in that bag.
30. Correct the error in the section in italics in any **four** of the following sentences :
- (a) *How a beautiful* bride she made!
 - (b) *What does he* think he is!
 - (c) *So big eyes* you have!
 - (d) *Wow,* that hurts!
 - (e) That soup was *how delicious!*
31. Fill in the blanks with suitable pronouns :
- (a) My grandparents live in Berlin. We visit _____ often.
 - (b) I really like watching old shows _____ are some of the best things on TV.
 - (c) I'm always talking to _____.
 - (d) I don't recognize the song _____ is playing.

32. Correct the error in the words in italics :

- (a) My knife is *sharp* than yours.
- (b) Truth is *strange* than fiction.
- (c) He is the *idler* boy in the class.
- (d) Bangladesh has the *large* tea garden in the world.

33. Fill in the blanks with suitable words from those given in brackets :

(ailments, strength, suffer, harmony, tension, recover, tackles, outlined)

Yoga is a series of physical exercises that use the body and mind to create _____ and health within yourself. Yoga allows you to gain _____, calmness, and flexibility while relieving stress and _____ from your body. About 2000 years ago in India, a wise man, Pantanjali, _____ the system for Yoga. In his writings, he explains how Yoga _____ both physical and emotional _____. Yoga can not only help you _____ from a physical condition but it also can help those of us who _____ from anxiety or depression.

34. Fill in the blanks with the suitable conjunction :

- (a) He ran away _____ he was afraid.
- (b) You can have an ice cream _____ a brownie sundae.
- (c) Our hoard is little, _____ our hearts are great.
- (d) He is _____ foolish, _____ stubborn.

35. Rewrite the sentences replacing the italicised words with the appropriate word from the brackets :

(cosmopolitan, a cartographer, a recluse, an octogenarian, a polyglot, an atheist, an optimist, an immigrant)

- (a) It is not easy being a *foreigner who comes to settle* in the USA.
- (b) My grandpa is *eighty years old*.
- (c) I took up Spanish to become *someone who speaks more than one language*.
- (d) We need a person who *makes maps or charts to decode these cryptic maps*.

Read the passage and answer the questions given below :

36. The Indian Army is the land-based branch and the largest component of the Indian Armed Forces. The President of India is the Supreme Commander of the Indian Army, and it is commanded by the Chief of Army Staff (COAS), who is a four-star general. Two officers have been conferred with the rank of field marshal, a five-star rank, which is a ceremonial position of great honour. The Indian Army originated from the armies of the East India Company, which eventually became the British Indian Army, and the armies of the princely states, which finally became the national army after independence. The units and regiments of the Indian Army have diverse histories and have participated in a number of battles and campaigns across the world, earning a large number of battle and theatre honours before and after Independence.
- (a) Identify a word from the passage that means 'a part or element of a larger whole'.
 - (b) Use the word 'ceremonial' in a sentence of your own.
 - (c) Who commands the Indian Army?
 - (d) Trace the origin of the Indian Army.
37. The trend toward commodification of high-brow art took an ominous, if predictable, turn in the 1980s during the Japanese "bubble economy." At a time when Japanese share prices more than doubled, individual tycoons and industrial giants alike invested record amounts in some of the West's greatest masterpieces. Ryohei Saito, for example, purchased van Gogh's *Portrait of Dr. Gachet* for a record-breaking \$82.5 million. The work, then on loan to the Metropolitan Museum of Modern Art, suddenly vanished from the public domain. A representative of the Van Gogh museum, conceding that he had no legal redress, made an ethical appeal to Mr. Saito, asserting, "a work of art remains the possession of the world at large."
- (a) Identify a word from the passage that means 'dark' or 'menacing.'
 - (b) What did Mr. Saito purchase and at what cost?
 - (c) Use the word 'masterpiece' in a sentence of your own.
 - (d) What was the request made to Mr. Saito by the representative of the Van Gogh museum?

38. Surveillance has increased manifold since the 9/11 terror attacks on the World Trade Centre in the U.S. This increase in surveillance today shapes the relationship between the state and the individual. The state keeps an eye on its citizens, thereby positing each and every citizen as a potential wrong-doer. For instance, the proliferation of the CCTV cameras in streets, restaurants and in every imaginable public space. In fact, the camera need not even be functional in order to make the citizens behave themselves – its mere presence is enough to scare the citizens into submission. Such is the power of the mere potential of surveillance.
- (a) Identify a word from the brackets that means 'surveillance'.
(scrutiny, intelligence, attack, suspicion)
 - (b) Give the antonym of 'proliferation.'
 - (c) Which event resulted in the increase in surveillance?
 - (d) What power does the process of surveillance possess?

(6 × 4 = 24 Marks)

- IV. Answer any **two** of the following questions, choosing **one** each from any **two** Group.

GROUP – A

39. Read the following passage and answer the questions given below :

In 1970 geologists Kenneth J. Hsu and William B.F. Ryan were collecting research data while aboard the oceanographic research vessel *Glomar Challenger*. An objective of this particular cruise was to investigate the floor of the Mediterranean and to resolve questions about its geologic history. One question was related to evidence that the invertebrate fauna (animals without spines) of the Mediterranean had changed abruptly about 6 million years ago. Most of the older organisms were nearly wiped out, although a few hardy species survived. A few managed to migrate into the Atlantic. Somewhat later, the migrants returned, bringing new species with them. Why did the near extinction and migrations occur? Another task for the *Glomar Challenger*'s scientists was to try to determine the origin of the domelike masses buried deep beneath the Mediterranean seafloor.

With questions such as these clearly before them, the scientists aboard the *Glomar Challenger* proceeded to the Mediterranean to search for the answers. On August 23, 1970, they recovered a sample.

The investigators theorized that about 20 million years ago, the Mediterranean was a broad seaway linked to the Atlantic by two narrow straits. Crustal movements closed the straits, and the landlocked Mediterranean began to evaporate. Increasing salinity caused by the evaporation resulted in the extermination of scores of invertebrate species. Only a few organisms especially tolerant of very salty conditions remained. Later, under the weight of overlying sediments, this salt flowed plastically upward to form salt domes. The Mediterranean was a vast desert 3,000 meters deep. Then, about 5.5 million years ago came the deluge. As a result of crustal adjustments and faulting, the Strait of Gibraltar, where the Mediterranean now connects to the Atlantic, opened, and water cascaded spectacularly back into the Mediterranean. As the basin was refilled, normal marine organisms returned. The salt and gypsum, the faunal changes, and the unusual gravel provided abundant evidence that the Mediterranean was once a desert.

1. _____ is the word used in the passage for 'look into'.
2. The word _____ in the passage is related to 'the scientific study of oceans'.
3. _____ is a word from the passage that is an antonym of 'gradually'.
4. The phrase _____ in the passage means 'to obliterate'.
5. Use the word 'spectacular' in a sentence of your own.
6. The synonym for 'cascade' is
 - (a) steps
 - (b) pour rapidly into
 - (c) glitter
 - (d) transform
7. _____ is a word from the passage that is an antonym of 'scarce'.

8. Identify the statement which is true.
 - (a) The Mediterranean has undergone no change for millennia
 - (b) The Mediterranean is an ocean
 - (c) The Mediterranean transformed into a desert for a period of time
 - (d) None of these
9. What was the objective of the research by geologists Hsu and Ryan?
10. Mention one of the major questions related to the above objective.
11. According to theorists, what was the Mediterranean like 20 million years ago?
12. How did the Mediterranean become landlocked?
13. What impact did this have ecologically?
14. What is the Strait of Gibraltar?
15. Suggest a suitable title for the passage.

OR

40. Answer all the following questions :

Fill in the blanks with suitable articles, prepositions, conjunctions, adverbs or adjectives.

1. John answered the question _____.
2. We played a _____ tough match yesterday.
3. He is _____ talking about visiting his ancestral home.
4. She passed the exam _____.
5. She walked _____ down the road.
6. I'm _____ little excited because it's _____ Friday. There are _____ lot of good shows on TV today _____ one I usually watch is at 3:30.
7. Please get me a bag of _____ apples.

8. The dinner party went _____.
9. _____ spring arrives, we have to be prepared for more snow.
10. This salad is _____ delicious _____ healthy.

Rewrite as directed :

11. He will finish the work in a fortnight. (Use passive voice)
12. He said to me, "I don't believe you." (Change to indirect speech).
13. I wish I were young again. (Write an exclamatory sentence)
14. He requested him to wait there till he returned. (Change to direct speech).
15. Why was such a letter written by your brother? (Use active voice)

OR

41. Read the passage and answer the questions given below :

Paleontologists have argued for a long time that the demise of the dinosaurs was caused by climatic alterations associated with slow changes in the positions of continents and seas resulting from plate tectonics. Off and on throughout the Cretaceous (the last period of the Mesozoic era, during which dinosaurs flourished), large shallow seas covered extensive areas of the continents. Data from diverse sources, including geochemical evidence preserved in seafloor sediments, indicate that the Late Cretaceous climate was milder than today's. The days were not too hot, nor the nights too cold. The summers were not too warm, nor the winters too frigid. The shallow seas on the continents probably buffered the temperature of the nearby air, keeping it relatively constant.

At the end of the Cretaceous, the geological record shows that these seaways retreated from the continents back into the major ocean basins. No one knows why. Over a period of about 100,000 years, while the seas pulled back, climates around the world became dramatically more extreme: warmer days, cooler nights; hotter summers, colder winters. Perhaps dinosaurs could not tolerate these extreme temperature changes and became extinct.

Dissatisfaction with conventional explanations for dinosaur extinctions led to a surprising observation that, in turn, has suggested a new hypothesis. Scientists hypothesized that a single large asteroid, about 10 to 15 kilometers across, collided with Earth, and the resulting fallout created the boundary clay. Their calculations show that the impact kicked up a dust cloud that cut off sunlight for several months, inhibiting photosynthesis in plants; decreased surface temperatures on continents to below freezing ; caused extreme episodes of acid rain; and significantly raised long-term global temperatures through the greenhouse effect. This disruption of the food chain and climate would have eradicated the dinosaurs and other organisms in less than fifty years.

1. The synonym for 'flourish' is
 - (a) thrive
 - (b) shake
 - (c) impress
 - (d) address
2. The word _____ in the passage relates to the chemical composition of the earth and its rocks and minerals.
3. Find the word in the passage that is the antonym of 'hot'.
4. The word 'buffer' in the passage is closest in meaning to
 - (a) erupt
 - (b) shower
 - (c) shield
 - (d) none of the above
5. Use the word 'evidence' in a sentence of your own.
6. Identify a word from the passage that means 'consequence or result of something.'
 - (a) fallout
 - (b) dismal
 - (c) experience
 - (d) none of the above
7. Use the word 'eradicate' in a sentence of your own.
8. Identify the statement which is true
 - (a) The climate during the late Cretaceous was harsh.
 - (b) The climate during the late Cretaceous was cold.
 - (c) The climate during the late Cretaceous was mild.
 - (d) None of these.

6. "Pull it out by its plug, not by the cord," said dad. No error.
 a b c d
7. Either the captain or someone from his crew is responsible for this mistake.
 a b c
No error.
 d
8. She reimbursed back the money which I had spent during
 a b
our journey to Jaipur. No error.
 c d
9. Either Lisa or Karen will always volunteer their valuable time
 a b
to serve on our board. No error
 c d
10. When she entered the room, she found the child
 a b
sleeping peacefully. No error.
 c d
11. "They had went to the lake without me", Jack complained. No error.
 a b c d
12. Do you think they will except our plan without an argument? No error.
 a b c d
13. The conversation with her mother had a profound affect on her. No error
 a b c d
14. Any of these pictures is not worth seeing. No error.
 a b c d
15. Symptoms of this illness includes fever, vomiting and diarrhoea. No error.
 a b c d

OR

43. Read the passage and answer the questions given below.

The Alaska pipeline starts at the frozen edge of the Arctic Ocean. It stretches southward across the largest and northernmost state in the United States, ending at a remote ice-free seaport village nearly 800 miles from where it begins. It is massive in size and extremely complicated to operate.

The steel pipe crosses windswept plains and endless miles of delicate tundra that tops the frozen ground. It weaves through crooked canyons, climbs sheer mountains, plunges over rocky crags, makes its way through thick forests, and passes over or under hundreds of rivers and streams. A little more than half of the pipeline is elevated above the ground. The remainder is buried anywhere from 3 to 12 feet, depending largely upon the type of terrain and the properties of the soil.

One of the largest in the world, the pipeline cost approximately \$8 billion and is by far the biggest and most expensive construction project ever undertaken by private industry. In fact, no single business could raise that much money, so eight major oil companies formed a consortium in order to share the costs. Each company controlled oil rights to particular shares of land in the oil fields and paid into the pipeline-construction fund according to the size of its holdings. Today, despite enormous problems of climate, supply shortages, equipment breakdowns, labour disagreements, treacherous terrain, a certain amount of mismanagement, and even theft, the Alaska pipeline has been completed and is operating.

1. The word 'remote' in the passage is closest in meaning to
 - (a) electronic device
 - (b) unrelated
 - (c) sizeable
 - (d) far away from civilisation
2. The phrase 'windswept plains' in the passage is closest in meaning to
 - (a) unsheltered land
 - (b) bayou
 - (c) plateau
 - (d) mountain

3. Find the word in the passage which is the antonym of 'molten'.
4. Use the word 'complicated' in a sentence of your own.
5. The phrase 'plunges over' in the passage means
 - (a) climb up
 - (b) stream by
 - (c) falls over
 - (d) flow across
6. _____ is a word in the passage which means 'bent' or 'twisted.'
7. The word 'consortium' in the passage means
 - (a) an association
 - (b) a condition
 - (c) a result
 - (d) none of the above
8. Use the word 'treacherous' in a sentence of your own.
9. Identify the statement which is true with regard to the Alaska pipeline
 - (a) One company holds the rights to it.
 - (b) Several governments together hold the rights.
 - (c) A consortium of eight oil companies holds the rights.
 - (d) None of these.
10. What is the Alaska pipeline?
11. Describe the terrain on which the pipeline is built.
12. A consortium was formed for the construction and operation of the pipeline. Why?
13. How is it significant in terms of size and cost?
14. What were the challenges, excluding the cost, faced while constructing the pipeline?
15. Suggest a suitable title for the passage.

OR

44. Answer **all** of the following questions. Fill in the blanks with suitable articles, prepositions, conjunctions, adverbs or adjectives.

1. They travelled _____ the river.
2. My brother loves animals. He just brought a puppy _____ a kitten home with him.
3. We could cook dinner _____, we could buy some takeaway food.
4. Marie was born in 1867 _____ Warsaw, Poland _____ an early age, she displayed a brilliant mind. Her great exuberance _____ learning prompted her to continue _____ her studies after high school.
5. Jennifer does not like to swim, _____ does she enjoy cycling.
6. His two favourite sports are football _____ tennis.
7. He is _____ intelligent, _____ very funny.
8. The treasure lies _____ the box.
9. The cat is sleeping _____ the bed.
10. _____ I wake up early.

Rewrite as directed :

11. Of his birth many tales are told. (Write in active voice)
12. Only the brave deserves the praise. (Change into negative)
13. "Please sit down", said the headmaster. (Change into indirect speech)
14. They proclaimed him king. (Write in passive voice).
15. His father told him that he was ashamed of him. (Change into direct speech)

(2 × 15 = 30 Marks)

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(Pages : 4)

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Reg. No. :

Name :

Third Semester B.Sc. Degree Examination, January 2023

Career Related First Degree Programme under CBCSS

Group 2 (a) – Physics and Computer Applications

Vocational Course

PC 1371 : MICROPROCESSORS

(2021 Admission)

Time : 3 Hours

Max. Marks : 80

SECTION – A (Very Short Answer Type)

One word to maximum of one sentence. Answer all questions.

1. _____ instruction enables subtraction with borrow.
2. The number of pins in 8086 microprocessor is _____.
3. The _____ directive instructs the assembler to begin memory allocation for a segment/block/code from the stated address.
4. _____ are the number of address lines that are present in 8086 microprocessor.
5. _____ is the word length of the Pentium-II microprocessor.
6. Full form of BIU in 8086 microprocessor is _____.
7. Instructions in a microprocessor, are fetched from _____.

P.T.O.

8. The number of operations processed per second by a processor is called _____.
9. _____ converts mnemonic to machine code.
10. _____ is the extension of assembly level program.

(10 × 1 = 10 Marks)

SECTION – B (Short Answer)

Not to exceed **one** paragraph, answer any **eight** questions. **Each** question carries **2** marks.

11. What is Complex Instruction Set Microprocessor?
12. What are the operating modes in 8086 microprocessor?
13. What is de multiplexing?
14. What are even and odd memory banks?
15. What is meant by addressing modes?
16. What is execution time of a microprocessor?
17. What are data transfer schemes?
18. What is string manipulation in microprocessor?
19. What are program development tools?
20. What is an interrupt in personnel computer?
21. What is hand coding?
22. What are variables and constants in assembly language?
23. Mention any two differences between 8086 and 80286 processor.

24. Mention any two features of 80486 processor.
25. What is dual pipelining in Pentium processor?
26. What is a dual core processor?

(8 × 2 = 16 Marks)

SECTION – C (Short Essay)

Not to exceed **120** words, answer any **six** questions. Each question carries **4** marks.

27. Explain reduced instruction set and complex instruction set microprocessor.
28. Explain multiplexing in microprocessor.
29. Discuss signals in 8086 microprocessor.
30. Explain instruction format in 8086 microprocessor.
31. Explain any four addressing modes in 8086 microprocessor.
32. What are 8086 processor control instructions?
33. What is assembly language programming?
34. Explain any four assembly language directives.
35. What are procedures and macros in assembly language?
36. Explain 80186 microprocessor.
37. Discuss on 80386 microprocessor.
38. Explain Pentium processor.

(6 × 4 = 24 Marks)

SECTION – D (Long Essay)

Answer any **two** questions. **Each** question carries **15** marks.

39. Discuss the basic functional blocks of a microprocessor.
40. Explain 8086 microprocessor pins.
41. Discuss about the instruction set of 8086 microprocessor.
42. Discuss interrupts in 8086 microprocessor.
43. Explain flag register in 8086 microprocessor.
44. Discuss on 8259 Programmable Interrupt Controller.

(2 × 15 = 30 Marks)

(Pages : 4)

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Reg. No. :

Name :

Third Semester B.Sc. Degree Examination, January 2023

Career Related First Degree Programme Under CBCSS

Group 2(a) – Physics and Computer Applications

Vocational Course

PC 1372 : DATA STRUCTURES

(2021 Admission)

Time : 3 Hours

Max. Marks : 80

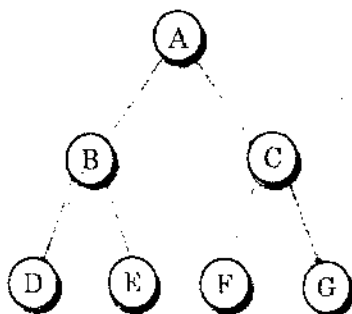
SECTION A – (Very Short Answer Questions)

Answer **all** questions. **Each** question carries **1** mark.

1. What do you mean by arrays?
2. Mention two advantages of linked list over an array.
3. What is a complete binary tree?
4. Convert following equation from infix to postfix form
 $A * (B + C) / D * E.$
5. What is a hash table?
6. Define a graph.
7. List two nonlinear data structures.

P.T.O.

- What do you mean by quadratic probing?
- What do you mean by dequeue?
- Traverse the following tree in preorder.



(10 × 1 = 10 Marks)

SECTION B – (Brief Answer Questions)

Answer **any eight** questions. Each question carries **2** marks.

11. Explain various data structure operations.
12. Short note on memory representation of two-dimensional array.
13. Write note on priority queue.
14. Convert following to prefix form.
 - (a) $A * (B * C) + D - (E + F)$
 - (b) $(A + B) * C + (D - E) / F * G$
15. Explain various representations of Binary Tree.
16. Define the following
 - (a) Directed graph
 - (b) Weighted graph

17. Write note on stack.
18. Explain traversal operations of a linear linked list.
19. What do you mean by data structures?
20. Mention two applications of queue.
21. Explain the need of graph data structure.
22. What do you mean by height of a tree?
23. What is a sequential search?
24. Explain the steps of inorder traversal.
25. What is a triangular matrix?
26. What is the use of postfix notation over other notations?

(8 × 2 = 16 Marks)

SECTION C – (Short Essay Type Questions)

Answer **any six** questions. Each question carries **4** marks.

27. Compare linear and nonlinear data structures.
28. Write short note on circular header linked list.
29. Explain stack operations in detail.
30. Explain evaluation of postfix expression in detail.
31. Write short note on expression tree.
32. Explain the various graph traversal operations.
33. Write an algorithm to perform linear search in an array.
34. Write short note on sparse matrix.
35. Write short note on collision resolution.

36. Short note on BFS.
37. Explain selection sorting mechanism.
38. Write short notes on circular queue.

(6 × 4 = 24 Marks)

SECTION D – (Long Essays)

Answer **any two** questions. **Each** question carries **15** marks.

39. Explain various types of linked list.
40. Explain various operations on queue using array.
41. Explain Binary Search algorithm in detail with an example.
42. Explain various hashing techniques in detail.
43. Explain various operations on a binary search tree.
44. Explain bubble sort algorithm with example.

(2 × 15 = 30 Marks)

Reg. No. :

Name :

Third Semester B.Sc. Degree Examination, January 2023.

Career Related First Degree Programme under CBCSS

Mathematics

Complementary Course for Physics and Computer Applications

MM 1331.6 – MATHEMATICS III – THEORY OF MATRICES, VECTOR
INTEGRATION, DIFFERENTIAL EQUATIONS AND FOURIER SERIES

(2019 Admission onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – I

Answer **all** questions

1. Find the determinant of $\begin{bmatrix} 2 & 4 & 6 \\ -1 & -2 & -3 \\ 5 & 3 & -7 \end{bmatrix}$.

2. Find the parametric representation of the line passing through (1,2,3) and parallel to the vector $2i - 2j + 3k$.

3. Find $A^T - A$ if $A = \begin{bmatrix} 1 & 2 & 1 \\ 2 & 4 & 3 \\ 1 & 3 & 2 \end{bmatrix}$.

4. Write an example for a variable separable first order ODE.

5. Find the integrating factor of the differential equation $y' + \frac{y}{x} = x^2$.
6. Write the general form of the second order linear homogeneous ODE.
7. Show that $F = \cos xi + y^2j + z^3k$ is a conservative field.
8. If $\phi(x, y, z) = x^2y + y^2z + z^2x$ then find $\int_{(0,0,0)}^{(1,1,1)} \nabla \phi \cdot dr$ along $x = y = t^2$ and $z = t$.
9. State stokes theorem.
10. Find the period of the function $f(x) = \sin 4x$.

(10 × 1 = 10 Marks)

SECTION – II

Answer **any eight** questions

11. Find the angle between the vectors $A = 3 + 6j + 9k$ and $B = -2i + 3j + k$.
12. Using the concept of Wronskian, verify whether the functions $f(x) = 1, g(x) = x$ and $h(x) = \sin x$ are linearly independent or not?
13. Find the distance between the points in 4-dimensional space: $(-1, 2, 6, 3)$ and $(0, 3, 7, 4)$.
14. Show that the vectors $A = 2 + 2j - 2k$ and $B = 2i + 3j - 5k$ are perpendicular.
15. Find $\int_{(0,0)}^{(1,2)} ydx + xdy$ along the line $x = t$ and $y = 2t$.
16. Evaluate $\int xdy - ydx$ around the circle $x^2 + y^2 = 1$.

17. Using Greens theorem find the area of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$.
18. Evaluate the integral $I = \int_C (x-y)^2 ds$, where C is the semicircle of radius a running from $A = (a,0)$ to $B = (-a,0)$ and for which $y \geq 0$.
19. Solve $y' = -2xy$ given $y(0) = 1.8$.
20. Under what condition for the constants α and β , the equation $\alpha(x+2y)dx + \beta(8x+y)dy = 0$, become exact?
21. Define Integrating factor, Show that $F(x,y) = \frac{1}{xy}$ is an integrating factor for the differential equation $-ydx + xdy = 0$.
22. Find the Orthogonal trajectory of the family of curves $xy = C$ where C is the varying parameter.
23. Find the average value of the function $f(x) = 4x^3$ in the interval (1,2).
24. Define Fourier series of a $2T$ periodic function $f(x)$ in the interval $(-T, T)$.
25. Define complex form of Fourier series of a function $f(x)$ in $(-\pi, \pi)$.
26. Find the Fourier series of $f(x) = x$, $-\pi \leq x \leq \pi$.

(8 × 2 = 16 Marks)

SECTION – III

Answer **any six** questions

27. Find A^* and AA^* if $A = \begin{bmatrix} 0 & 2i & -1 \\ -i & 2 & 0 \\ 3 & 0 & 0 \end{bmatrix}$.
28. Using Cramer's rule solve the system
 $3x + 4y + 5z = 18$, $2x - y + 8z = 13$ and $5x - 2y + 7z = 20$.
29. Find the eigen values of $\begin{bmatrix} 5 & -10 & -5 \\ 2 & 14 & 2 \\ -4 & -8 & 6 \end{bmatrix}$.
30. Find an integrating factor of the differential equation $(x^2 + y^2)dx - 2xydy = 0$ and hence find its solution.
31. Solve $x \log x \frac{dy}{dx} + y = 2 \log x$.
32. Solve $(3xy + y^2)dx - 3x^2dy = 0$.
33. Evaluate the line integral $\int_C xdx - yzdy + e^z dz$ where C is the curve with coordination function $x = t^3$, $y = -t$ and $z = t^2$, $1 \leq t \leq 2$.
34. Find the vector area of the surface of the hemisphere $x^2 + y^2 + z^2 = a^2$ with $z \geq 0$.
35. Show that the vector field $F = 3x^2yz^2i + (x^3z^2 + e^z)j + (2x^3yz + ye^z)k$ is conservative and find its potential function.
36. Find Fourier integral representation of the function $f(x) = \begin{cases} 1 & \text{if } |x| < 1 \\ 0 & \text{if } |x| > 1 \end{cases}$.

37. Find the Fourier transform of the exponential decay function

$$f(t) = \begin{cases} 0 & t < 0 \\ Ae^{-\lambda t} & t \geq 0 \end{cases} \text{ for } t \geq 0 \text{ and } \lambda > 0.$$

38. Find Fourier series of $f(x) = e^x, -\pi \leq x \leq \pi$ where $f(x + 2\pi) = f(x) \forall x$.

(6 × 4 = 24 Marks)

SECTION – IV

Answer **any two** questions

39. What do you mean by the diagonalization of a matrix, Diagonalize the matrix

$$\begin{bmatrix} 4 & -3 & -3 \\ 3 & -2 & -3 \\ -1 & 1 & 2 \end{bmatrix}.$$

40. Using Gram-Schmidt orthogonalization process find an orthonormal basis of \mathbb{R}^3 correspond to the ordered basis $B = \{(1,1,1), (1,0,1), (1,1,2)\}$.

41. (a) Find an integrating factor of $(xy^3 + y)dx + 2(x^2y^2 + x + y^4)dy = 0$ and hence solve.

(b) Convert the given differential equation $(e^{x+y} + ye^y)dx + (xe^y - 1)dy = 0$ to an exact differential equation and solve for the particular solution if $y(0) = -1$.

42. Solve the following

(a) $(2x - 4y + 5)\frac{dy}{dx} + x - 2y + 3 = 0$

(b) $(1 + y^2)\frac{dx}{dy} + x = e^{\tan^{-1}y}$.

(c) $\frac{dy}{dx} + y \tan x + y^2 \sec x = 0$.

43. (a) State Green's theorem in plane.

(b) Verify the greens theorem in the plane $\oint_C (3x^2 - 8y^2)dx + (4y - 6xy)dy$
where C is the boundary of the region defined by $y = \sqrt{x}$, $y = x^2$.

44. (a) Express $f(x) = x^2$ as a half range sine series expansion over the interval $[0,2]$.

(b) Express $f(x) = x + 1$ as a half range sine series expansion over the interval $[0, \pi]$.

(2 × 15 = 30 Marks)

Reg. No. :

Name :

Third Semester B.Sc. Degree Examination, January 2023

Career Related First Degree Programme under CBCSS

Physics and Computer Applications

Core Course

PC 1341 : ELECTRODYNAMICS

(2019 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

PART – A

Answer **all ten** questions. Each carry **1** mark.

1. What is meant by an equipotential surface?
2. What are dielectric materials?
3. What do you mean by the magnetic susceptibility of a material?
4. Write down the expressions for σ_b and ρ_b in terms of Polarization.
5. Explain Biot-Savart's law.
6. What do you mean by electromotance?
7. What is a monochromatic plane wave?
8. Write down the expressions for time constant in an L-R circuit and R-C circuit.
9. What do you mean by Q- factor?
10. Explain the maximum power transfer theorem.

(10 × 1 = 10 Marks)

P.T.O.

PART – B

Answer **any eight** questions of **2** marks.

11. What is Gauss's law and its integral representation?
12. Discuss about the Energy of a continuous charge distribution.
13. Explain Gauss's law, how its modified in the presence of dielectrics.
14. Comment on the electric field inside a charged conductor.
15. Differentiate between polar and nonpolar molecules with examples.
16. State boundary condition of \vec{E} and \vec{D} .
17. Explain Amperes circuital theorem, find the magnetic field due to a solenoid and toroid.
18. Prove that magnetic field \vec{B} is solenoidal and how it guarantees magnetic monopole do not exist.
19. What are paramagnetic substances, Explain with examples?
20. What is Ohm's law, explain the terms resistivity and conductivity and differentiate between insulator, conductors and semi-conductors?
21. How Maxwell corrected amperes law?
22. What do you mean by EM waves?
23. Explain Poynting theorem.
24. What are the applications of maximum power transfer theorem?
25. Explain resonance in series LCR circuit.
26. What is Thevenin's theorem?

(8 × 2 = 16 Marks)

PART – C

Answer **any six** questions, not exceeding a paragraph. Each carries **4** marks.

27. What distance must separate two charges of $+5.6 \times 10^{-4} \text{ C}$ and $-6.3 \times 10^{-4} \text{ C}$ in order to have an electric potential energy with a magnitude of 5.0 J in the system of the two charges?

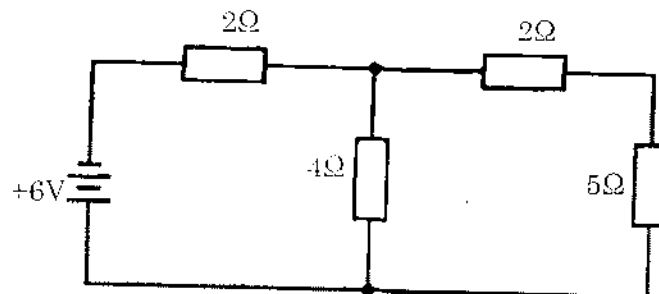
The current in an inductive circuit is given by $0.3 \sin (200t - 40^\circ)$ A. Write the equation for the voltage across it if the inductance is 40 mH.

What is the time constant of

(a) RC circuit with $R = 10 \text{ K}\Omega$ and $C = 20 \mu\text{F}$.

(b) L-R circuit with $R = 10 \text{ K}\Omega$ and $L = 60\text{mH}$.

38. Calculate the Thevenin's voltage in the given circuit.



(6 × 4 = 24 Marks)

PART - D

Answer **any two** questions. Each question carries **15** marks.

39. Define potential. Find the potential due to uniformly charged conducting sphere.
40. Discuss the significance of free charges and bound charges produced due to polarization.
41. Derive the continuity equation from Maxwell's relation.
42. Derive the electromagnetic wave equations for good conductor.
43. A series LCR circuit is connected to an ac source. Using the phasor diagram, derive the expression for the impedance of the circuit.
44. Explain Norton's theorem in detail.

(2 × 15 = 30 Marks)