

BP4-EPSC: ENGLISH FOR PHYSICAL SCIENCES

INTERNAL EXAMINATION

Questions Paper Pattern

BP4-EPSCMQ

I Listening (15 marks)

Three passages - all passages to include a question on vocabulary. 5x3=15

- a. Instruction / process description/ domain specific passage followed by info gap activities to include questions on vocabulary.
- b. Listen and complete a flow chart.
- c. Listen and compose a paragraph.

II Speaking (15 marks)

Three speaking activities – Individual, pair and Group. All activities to include use of domain specific vocabulary 5x3 = 15

- a. Individual – short talk (OR)
- b. presentation with PPT
- c. Pair – mind mapping - brain storming with Role play / Interview
- d. Group – Group discussion

III Reading (10 marks)

Two passages – fact and opinion (simple content from domain with/ without questions pertaining to understanding and analysis (Critical Thinking). 5x2=10

- a. 8. Passage to distinguish fact and opinion
- b. 9. Describe a process based on inputs from a passage or a picture.

IV Writing. All activities to include use of domain specific vocabulary.

5x2=10

- a. Develop a story from pictures
- b. Passage describing products / gadgets / process

ENGLISH FOR PHYSICAL SCIENCES

INTERNAL EXAMINATION

Model Question Paper

1. Listen to the passage and complete the tasks that follow. (5 marks)

With worldwide mobile subscriptions estimated to be around 7 billion in 2014, cell phones have become a universal and indispensable tool for modern life. With a cell phone, you can talk to anybody on the planet from almost anywhere. But do you really know how your cell phone works? In the most basic form, a cell phone is essentially a two-way radio, consisting of a radio transmitter and a radio receiver. When you chat with your friend on your cell phone, your phone converts your voice into an electrical signal, which is then transmitted via radio waves to the nearest cell tower. The network of cell towers then relays the radio wave to your friend's cell phone, which converts it to an electrical signal and then back to sound again. In the basic form, a cell phone works just like a walkie-talkie. In addition to the basic function of voice calls, most modern cell phones come with additional functions such as web surfing, taking pictures, playing games, sending text messages and playing music. More sophisticated smart phones can perform similar functions of a portable computer.

Cell phones use radio waves to communicate. Radio waves transport digitized voice or data in the form of oscillating electric and magnetic fields, called the electromagnetic field (EMF). The rate of oscillation is called frequency. Radio waves carry the information and travel in air at the speed of light. Cell phones transmit radio waves in all directions. The waves can be absorbed and reflected by surrounding objects before they reach the nearest cell tower. For example, when the phone is placed next to your head during a call, a significant portion (over half in many cases) of the emitted energy is absorbed into your head and body. In this event, much of the cell phone's EMF energy is wasted and no longer available for communication.

Cell phones contain at least one radio antenna in order to transmit or receive radio signals. An antenna converts an electric signal to the radio wave (transmitter) and vice versa (receiver). Some cell phones use one antenna as the transmitter and receiver while others, such as the iPhone 5, have multiple transmitting or receiving antennas. An antenna is a metallic element (such as copper) engineered to be a specific size and shape for transmitting and receiving specific frequencies of radio waves. While older generation cell phones have external or extractable antennas, modern cell phones contain more compact antennas inside the device thanks to advanced antenna technologies. It's important to understand that any metallic components in the device (such as the circuit board and the metal frame for the iPhone) can interact with the transmission antenna(s) and contribute to the pattern of the transmitted signal. Many modern smart phones also contain more than one type of antenna. In addition to the cellular antenna, they may also have Wi-Fi, Bluetooth and/or GPS antennas.

As mentioned earlier, a cell phone is a two-way wireless communication device and needs both the inbound signal (reception) and the outbound signal (transmission) to work. The magnitude of the received signal from the cell tower is called the "signal

strength”, which is commonly indicated by the “bars” on your phone. The connectivity between a cell phone and its cellular network depends on both signals and is affected by many factors, such as the distance between the phone and the nearest cell tower, the number of impediments between them and the wireless technology (e.g. GSM vs. CDMA). A poor reception (fewer bars) normally indicates a long distance and/or much signal interruption between the cell phone and the cell tower.

In order to conserve battery life, a cell phone will vary the strength of its transmitted signal and use only the minimum necessary to communicate with the nearest cell tower. When your cell phone has poor connectivity, it transmits a stronger signal in order to connect to the tower, and as a result your battery drains faster. That’s why good connectivity not only reduces dropped calls, but also saves battery life

- a. Match the following. (1)
 - i. good connectivity - poor reception
 - ii. Antennas - portable computer
 - iii. Fewer bars - conserves battery life
 - iv. Smart phones - receive and transmit radio signals
- b. A Cell phone works like a _____. (1)
- c. The word antenna here means_____ (1)
 - i)Copper element
 - ii) feelers on the insect’s head
 - iii) receiver
- d. Mention two ways use of Cell phones can affect us. (2)

2. Listen to the following and explain the process using flow chart. (5x1=5)

Ingredients and equipment

- coconut oil $\frac{2}{3}$ cup (helps to produce lather)
- olive oil $\frac{2}{3}$ cup
- other liquid oil $\frac{2}{3}$ cup – like almond oil, grapeseed, sunflower or safflower oil
- $\frac{1}{4}$ cup lye – also called 100% sodium hydroxide
- $\frac{3}{4}$ cup cool water (use distilled or purified)
- Large glass jar
- Small glass jar
- Soap moulds
- Gloves and protective goggles

Instructions

First cover your work area. Put your gloves and other protective wear on. Measure your water into the large glass jar. Have a spoon ready. Measure your lye, making sure you have exactly $\frac{1}{4}$ cup. Slowly pour the lye into the water (never the water into lye) stirring as you go. Stand back while you stir to avoid the fumes. When the water starts to clear, you can allow it to sit while you move to the next step. It will generate heat as the chemical reaction occurs. In the small glass jar, add your three oils together. They should just make a pint. Heat in a

microwave for about a minute, or place the jar of oils in a pan of water to heat. Check the temperature of your oils – it should be about 120°F or so. Although you can use a soap-maker thermometer, a regular meat thermometer will also work. Your lye should have come down by then to about 120°F. Wait for both to cool somewhere between 95°F and 105°F. *This is critical for soap making.* Too low and it'll come together quickly, but be coarse and crumbly. When both the lye and oils are at the right temperature, pour the oils into a mixing bowl. Slowly add the lye, stirring until it's all mixed. Stir by hand for a full 5 minutes with any spoon or spatula that is heat-resistant. It's very important to get as much of the lye in contact with as much of the soap as possible. After about 5 minutes, you can keep stirring or you can use an immersion blender. The soap mixture will lighten in colour and become thick. When it looks like vanilla pudding it's ready. Add your herbs, essential oils or other additions. Stir thoroughly to combine. Pour the mixture into mould(s) and cover with plastic wrap. Set in an old towel and wrap it up. This will keep the residual heat in and start the saponification process. After 24 hours, check your soap. If it's still warm or soft, allow it to sit another 12 to 24 hours. When it's cold and firm, turn it out onto a piece of parchment paper or baking rack. If using a loaf pan as your mould, cut into bars at this point. Allow soap to cure for 4 weeks or so. Be sure to turn it over once a week to expose all the sides to air, or put it on a backing rack to allow air to circulate. When your soap is fully cured, wrap it in wax paper or keep it in an airtight container. Hand-made soap creates its own glycerin, which is a humectant, pulling moisture from the air. It should be wrapped to keep it from attracting dust and debris with the moisture. Clean your equipment that has been exposed to lye. You can neutralize the lye with [white vinegar](#), then wash the equipment well as you normally would.

3. Listen to the passage, take notes as you listen and compose them into a paragraph.

Chandrasekhara Venkata Raman was born at Tiruchirappalli in Southern India on November 7th, 1888. His father was a lecturer in mathematics and physics so that from the first he was immersed in an academic atmosphere. He entered Presidency College, Madras, in 1902, and in 1904 passed his B.A. examination, winning the first place and the gold medal in physics; in 1907 he gained his M.A. degree, obtaining the highest distinctions. His earliest researches in optics and acoustics – the two fields of investigation to which he has dedicated his entire career – were carried out while he was a student. Since at that time a scientific career did not appear to present the best possibilities, Raman joined the Indian Finance Department in 1907; though the duties of his office took most of his time, Raman found opportunities for carrying on experimental research in the laboratory of the Indian Association for the Cultivation of Science at Calcutta (of which he became Honorary Secretary in 1919).

In 1917 he was offered the newly endowed Palit Chair of Physics at Calcutta University, and decided to accept it. After 15 years at Calcutta he became Professor at the Indian Institute of Science at Bangalore (1933-1948), and since 1948 he is Director of the Raman Institute of Research at Bangalore, established and endowed by himself. He also founded the *Indian Journal of Physics* in 1926, of which he is the Editor. Raman sponsored the establishment of the Indian Academy of Sciences and has served as President since its inception. He also initiated the *Proceedings* of that academy, in which much of his work has been published, and is President of the Current Science Association, Bangalore, which publishes *Current Science (India)*. Some of Raman's early memoirs appeared as Bulletins of the *Indian Association for the Cultivation of Science* (Bull. 6 and 11, dealing with the "Maintenance of Vibrations"; Bull. 15, 1918, dealing with the theory of the musical instruments of the violin family). He contributed an article on the theory of musical instruments to the 8th Volume of

the *Handbook of Physics*, 1928. In 1922 he published his work on the “Molecular Diffraction of Light”, the first of a series of investigations with his collaborators which ultimately led to his discovery, on the 28th of February, 1928, of the radiation effect which bears his name (“A new radiation”, *Indian J. Phys.*, 2 (1928) 387), and which gained him the 1930 Nobel Prize in Physics.

II Speaking

5x3 = 15

- a. What is a Pandemic? How are the lives of different people affected during this time?
S

Lockdown	infection	covid 19	migrant workers	virus	epass
transport	vaccine	immunity	washing	sanitiser	steam

your thoughts on this. You can use the words in the help box.

- a. (OR)
- b. Give a short presentation on our favourite artist/ literary figure/ historical personality/ social activist/ economist. You can use a PPT to supplement your Presentation.
- c. You are invited for a Youth Chat show on online shopping / mobile apps for shopping. Prepare a mind map or brain storm our thoughts on the benefits and dangers of such shopping with your friend and role play the chat show.
- d. Reading as a habit has declined. Even those who read prefer to read online. Have a group discussion on the changing scenario of reading books.

III Reading

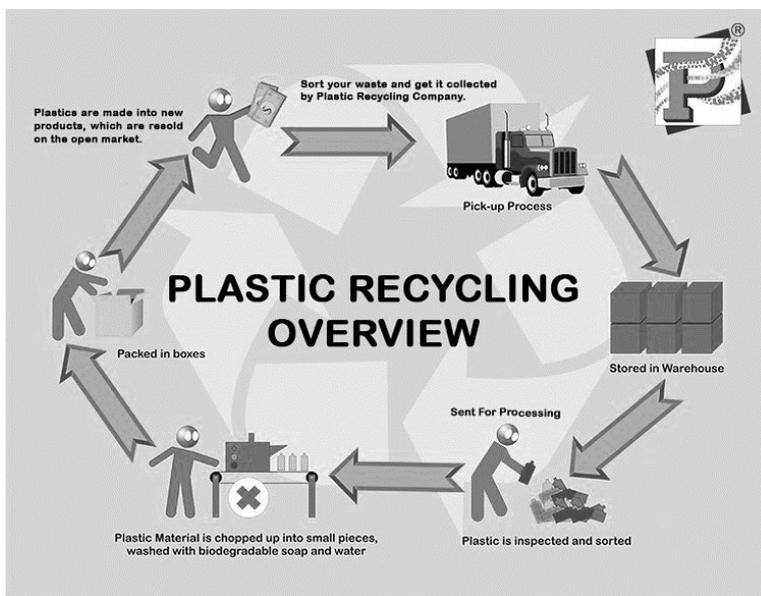
5x2=10

- a. **Read the following passage and segregate the facts from opinion about Architectural marvels.**

The leaning of the Tower of Pisa comes into the story in 1173, when construction began. Thanks to the soft ground, it had begun to lean by the time its builders got to the third story, in 1178. Shifting soil had destabilized the tower’s foundations. Over the next 800 years, it became clear the 55-metre tower wasn’t just leaning but was actually falling at a rate of one to two millimeters per year. Today, the Leaning Tower of Pisa is more than five meters off perpendicular. Its architect and engineer tried to correct this by making the remaining stories shorter on the uphill side – but to no avail. It kept leaning more and more. The lean, first noted when three of the tower’s eight stories had been built, resulted from the foundation stones being laid on soft ground consisting of clay, fine sand and shells. The next stories were built slightly taller on the short side of the tower in an attempt to compensate for the lean. Despite its inherent flaws in the structure, this tower is one of the Seven Wonders of the World, attracting a large number of tourists from around the world. However, the weight of the extra floors caused the edifice to sink further and lean more. The Big Temple of Thanjavur, built by one of the greatest kings of India , Raja Raja Chola and is one of the

marvels of architecture, the temple tower is 216 ft high and is among the tallest of its kind in the world, an idea to build a mammoth temple like this is said to have occurred to Raja Raja, the Emperor as a dedication to the Almighty. The main Tower was built over 12 years on a single piece of granite weighing around 80 tonnes. For centuries this temple has fascinated, historians, artists and travellers, for its architectural magnificence. It has been listed by UNESCO heritage list of historical sites. It is considered as the expression of the wealth, power and artistic expertise, but here people don't even consider it as a site to visit. Built in 1010 CE and completed its 1000th year in 2010, It certainly is a living wonder.

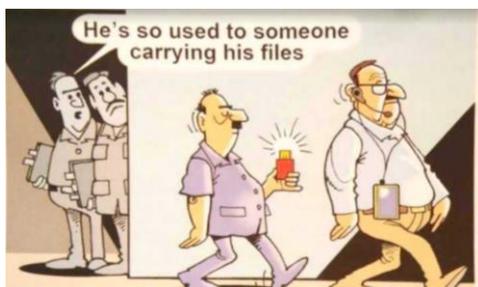
b. Do you know how plastic is recycled? Here is a picture describing the process. Use them to compose a paragraph.



IV Writing

5x2=10

a. Develop a story with this picture.



b. Write a short paragraph based on the hints given below.

Friction - found anywhere - objects - contact - each other - brakes - car - friction - brake pads - wheels of the car - to stop - person - running - sidewalk - stop quickly - friction caused -bottom of the shoes – concrete-other variables - lessen - effects – friction- same person - running - water-covered sidewalk, friction - less - runner –not-stop -may fall -similarly - car - stop - ice-covered roadway – low friction - cause - accidents - rain low friction - brakes - wheels - brakes - wet - wheels less- contact - ground - cars skid - too fast - puddles of water.

2. ENGLISH FOR PHYSICAL SCIENCES

End Semester Examination - 50 MARKS

Question Paper Pattern

I. VOCABULARY (MCQ, Info-gap questions – domain specific vocabulary)

(Q. No. A,B)

(10 MARKS)

II READING

10x2=20

C. One long passage (simple content from domain with questions pertaining to understanding and analysis (Critical Thinking).

D. Compare and contrast essay based on an info-graph – pie chart/ bar graph etc

III WRITING

10x2= 20

E. Long Passage for Note making and summarising

F. Free writing

2. ENGLISH FOR PHYSICAL SCIENCES

END SEMESTER EXAMINATION - 50 MARKS

Model Question Paper

I. VOCABULARY 10 marks)

A. Choose the appropriate meaning and write one sentence on our own using the word.

(5)

(i) **reaction**

- a chemical process in which substances act mutually on each other and are changed into different substances
- an immediate response
- a repeated action

(ii) **synthetic**

- a kind of cloth
- a mixture
- an artificial material produced by combining different substances

(iii) **observe**

- the action or process of closely monitoring something or someone
- seeing something
- to look at something

(iv) **particle**

- a part of an article
- an extremely small piece of matter
- solid substances

(v) radiation

- a. Radio waves
- b. energy that comes from a source in the form of waves or rays that one cannot see
- c. bright rays

B. Fill in the blanks with words given in the box. (5)

- (i) Electrolysis is a _____ to _____ a substance.
- (ii) Carbon is the _____ which is present in graphite and diamond.
- (iii) Combination of 2 or more elements makes a _____.
- (iv) _____ are liquids that help to _____ substances.
- (v) The _____ of oxygen is to help in the burning process.
- (vi) Fluorescent green colour gas was _____ during the process.
- (vii) The _____ went into _____ yesterday.

compound	Solvents	element	emitted	orbit
decompose	dissolve	satellite	process	property

II READING

10x2=20

C. Read the following passage and answer the questions that follow.

Physics extends well into your everyday life, describing the motion, forces and energy of ordinary experience. In actions such as walking, driving a car or using a phone, physics is at work. For everyday living, all the technologies you might take for granted exploit the rules of physics.

An easy place to see physics in action is with a simple lever – most easily observed at a park. Levers come in three models, each with varying fulcrum locations. They serve to magnify force, lessening the effort needed to move an object on the opposing end. A simple “see-saw” at a park consists of a lever (the locations for sitting) and the fulcrum (placed in the middle). The two opposing forces counterbalance each other, creating a smooth ride through the air. At the same park you'll see a slide, a device that combines the stairs going up with the slide going down, both examples of inclined planes. The inclined plane eases the effort of climbing by spreading it over a longer distance. The smooth slide returns you gently to earth, slowing the influence of gravity just enough to make it fun.

The transportation industry is no stranger to the manipulation of everyday physics. Cars and trains utilize the wheel, which provides a smooth, steady motion. Newton's laws of motion are at work as mechanical force and acceleration, action, reaction and inertia. Airplanes take it one step further, allowing lift as well as forward momentum. They manipulate physics – much like birds – by creating lift through wing shape as well as the wing's angle – both of which serve to alter airflow.

Physics is all relative. This theme resonates through Einstein's special and general theories of relativity. Einstein's work is crucially important to GPS in your phone, for

example. It takes radio signals from several satellites orbiting the Earth and calculates your location accurate to several centimetres. Because the speed and height of the satellites alters the signal very slightly, the smartphone adjusts the results using Einstein's theories. Without a helping hand from relativity, GPS would be far less accurate or useful.

Even as you read this sentence, physics is at work. The eyes evolved in many species – through several examples of convergent evolution – harnessing the electromagnetic spectrum. The ears hear sounds which occur through the movement of air molecules. And the chemistry that drives all of biology depend on the physics of energy and molecules. Every day, for example, plants absorb sunlight, water and carbon dioxide, creating glucose and releasing oxygen as a by-product.

(i) Answer the following questions. (8)

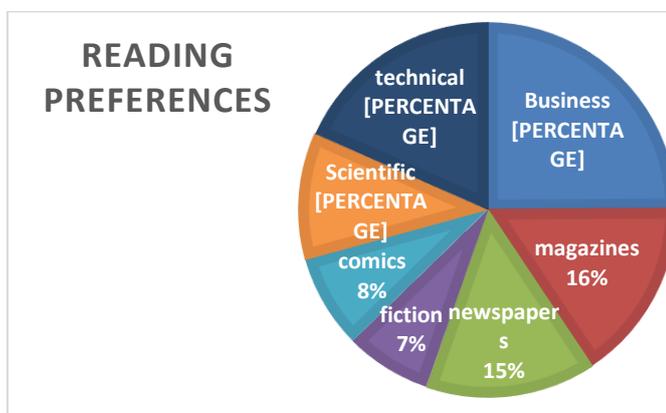
- a) Does the see-saw show physics at work? How? (2)
- b) Show how physics help children enjoy sliding in a park. (2)
- c) What concept of physics is used in the Transportation Industry? How? (2)
- d) How are Physics, Chemistry and Biology related in the functioning of the human body?(2)

(ii) Complete the following (2)

- a) _____ takes radio signals from several satellites orbiting the Earth.
- b) It calculates your location _____.
- c) The smart phone has to adjust the results using _____.
- d) (ii)This is because of the difference in _____ and _____ of the _____ that alters the signal.
- e) The _____ and _____ of the wings of the airplane help in making the plane fly.

D. In a survey done in a college recently, it was found that the students had varied preferences of reading.

The result of the survey is given in the pie chart below. Why do you think students preferences are so varied in modern times? Elaborate your reasons.



E. Read the following passage, make notes and summarise the information in two or three paragraphs. (10)

The cycle of life is supposed to have started with a Bang that led to events that we call the making of the Universe. If a slight attention is paid to the whole chain of the events that took place some millions of years ago, a basic question that will pop up in any prudent and reasonable mind would be 'Why did this whole bang take place?' Researchers opine that an exothermal reaction led by the fusion of some gases resulted in a blast. It was all due to the chemical reactions which we observe across the universe. It is amazing to know that chemistry has bestowed life upon this Earth.

Chemistry is a big part of our everyday life. One can easily observe this branch of science in different spheres of human life such as in the food we eat, the air we breathe, the various cleansing agents we use, so much so that even human emotions are sometimes a result of chemical reactions within our body!

Here are some of the most common chemistry experience you see in daily life

Ever tried to think why a particular vegetable bears a particular colour and taste? It has been founded that the sunlight is a beam of white light and when it impacts on an object some of them get absorbed while others are reflected back. The vegetables that are green are due to the presence of a chemical compound named chlorophyll which absorbs all the wavelengths while reflecting the green light. Similarly, the red colour of tomato which is used to judge its quality is a result of a chemical compound known as lycopene.

Who hasn't been mesmerized by the fluffiness of cakes that metamorphose from pastry dough to a tasty well-raised bundle of joy? Thanks to the chemical reaction of magic ingredients called baking soda and baking powder!

The teardrops rolling out from eyes while cutting an onion is due to the chemical reaction that turn the sulphur present in the onion cells to burst and to become a volatile sulphur product, which once released in air causes itching in eyes, resulting in the outpour of teardrops. Digestion relies on chemical reactions between food and acids and enzymes to break down molecules into nutrients the body can absorb and use. Soaps and detergents act as emulsifiers to surround dirt and grime so it can be washed away from clothing, dishes, and our bodies. Our body is made up of chemical constituents, present in a number of combinations of various elements – oxygen, carbon, hydrogen, nitrogen, calcium, and phosphorus.

Various emotions we feel are, in fact, a result of chemical messengers i.e. neurotransmitters. Love, jealousy, envy, infatuation and infidelity all find their roots in chemistry.

Medicines are the best example of chemistry which save us from diseases and make us able to live. They are essentially chemical compounds. Drugs work because of chemistry. The chemical compounds may fit into the binding site for natural chemicals in our body (e.g., block pain receptors) or may attack chemicals found in pathogens, but not human cells (e.g., antibiotics). Cooking is a chemical change that alters food to make it more palatable, kill dangerous microorganisms, and make it more digestible. The heat of cooking may denature proteins, promote chemical reactions between ingredients, caramelize sugars, etc.

It is easily observed that the most unobserved and repetitive phenomena that take place in our daily lives are so much entwined in chemical science. The list may be continued to fill hundreds of pages with the miracles of chemistry in our lives that take place each and every day. Thus, it is the Chemistry that is responsible for various unnoticed actions and reactions in the universe.

F. Write an essay on any ONE (10)

i) What are your views on online education? Do you think it will become the norm in the future?

ii) What do you plan to do in the next ten years? What career would you want to choose? Explain your views in three or four paragraphs.
